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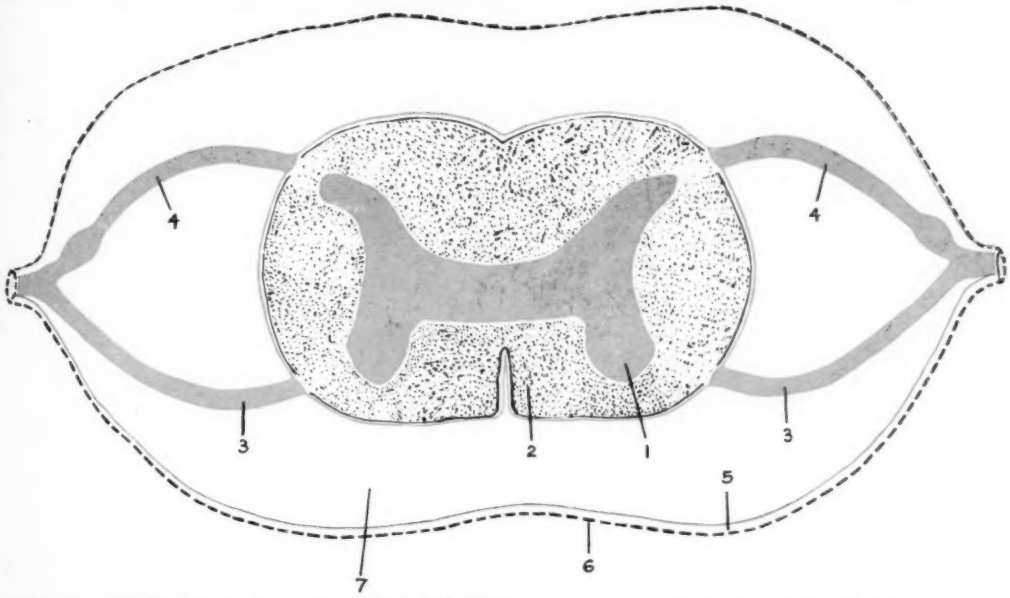

FIGURE 1-A. This diagram represents a spinal cord segment. (1) Grey substance. (2) White substance. (3) Anterior nerve roots. (4) Posterior nerve roots. (5) Spinal arachnoid. (6) Dura mater. (7) Subarachnoid space.

THE PHYSIOLOGY OF SPINAL ANESTHESIA*

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Since the advent of surgery on the human body there has always existed a fundamental law between the patient and the surgeon; namely, that it is the first duty of the surgeon to avail himself of every possible means within his power to preserve the life of the patient. If one is conscientious he does not hesitate to ask for consultation if he feels that his professional skill is wanting along some particular line, or if the patient's condition approaches the critical state. The conscientious surgeon also takes considerable care in the preoperative preparation of his patient. He demands a well-equipped operating room and insists that the assistants be well trained in sterile technique. But what consideration is given to the anesthetic? Ordinarily, a general anesthetic is chosen and left in the hands of the anesthetist with results usually being in a direct ratio to the latter's experience and ability. Not infrequently the anesthetic is left to one who is untrained and inexperienced, with the result that anesthetic morbidity and mortality are increased.

There is some little something missing in every good surgeon if he is not a good general anesthetist himself. He should know how to administer every acceptable method of anesthesia, and should know indications and contraindications of each, so that he may be able to choose for his patient the one offering the best chances of operative recovery in the shortest possible time. Not infrequently a patient suffers a more stormy convalescence from an ill-chosen general anesthetic than he does from the operation for which it was given.

To administer inhalation anesthesia to patients suffering with eclampsia or pernicious vomiting, bronchitis, pleurisy, pulmonary tuberculosis, diabetes, nephritis, alcoholism, pharyngeal or tracheal obstruction, acute coryza, influenza or post-influenzal convalescence, general peritonitis, intussusception, volvulous, strangulated hernia, prostatic disease, localized or pelvic peritonitis,

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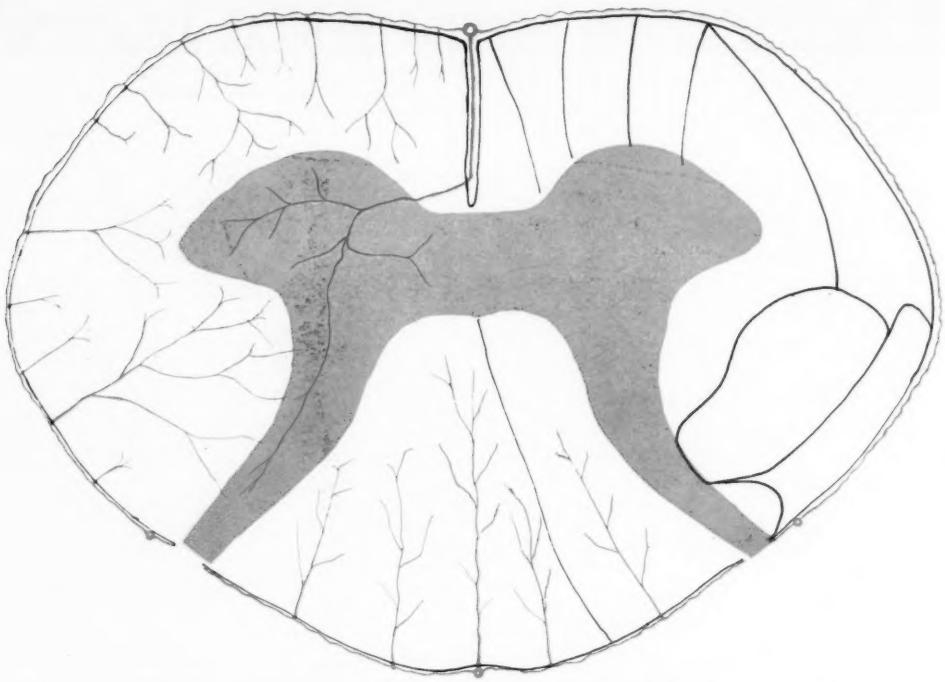

FIGURE 1-B. This diagram represents a cross section of the spinal cord showing its arterial network.

decompensated heart, hypertension, arteriosclerosis, extreme emaciation or obesity, one fails to adhere to the aforementioned fundamental law, and is, without doubt doing injustice to the patient by contributing directly to anesthetic—and indirectly to surgical,—morbidity and mortality. All of the above types of cases react much more favorably to spinal anesthesia. In fact, the majority of patients whose operation is to be below the diaphragm, whether inhalation anesthesia is contraindicated or not, do exceedingly well with spinal. It is the anesthetic of choice with the majority of surgeons who have made a special study of this method, who have acquired a fair knowledge of its physiological principles, and who have developed an accurate technique of induction.

The fact remains, however, that there is some opposition to, or rather fear of, spinal anesthesia among many surgeons who are unfamiliar with its use. This fear is apparently well founded on the part of one who does not know of the various physiological phenomena incident to this method, and who does not know why and how such phenomena occur. This fear, instead of being a drawback, serves a good purpose in that it tends to restrict the promiscuous and indiscriminate use of spinal anesthesia and thereby plays a great part in keeping a safe and valuable method from again falling into disrepute.

For one who thoroughly understands its physiological principles, spinal anesthesia holds no fears, therefore my remarks at this time will be limited strictly to the physiological phenomena which accompany this method.

In order to present a clear mental picture of these phenomena it will be necessary to review very briefly the anatomy of that portion of the central and autonomic nervous systems leading up to the physiology involved.

Grossly the medulla spinalis, or spinal cord, extends from the upper border of the atlas above to the second lumbar vertebra below (the third lumbar in children). It consists of the gray substance surrounded by the more resistent and less permeable white substance. The gray substance contains two anterior and two posterior horns, or columns, from which arise the ventral and dorsal roots of the spinal nerves. The white substance contains many tracts and funiculi, but as they are not directly involved in spinal anesthesia their division and description will not be given.

Though there are no visible external markings, the spinal cord anatomically is divided into eight cervical, twelve thoracic, five lumbar and five sacral spinal segments. A segment embraces that portion of the cord giving origin to one pair of spinal nerves (Fig. 1-A).

Two very tough membranes, the glial sheath and pia mater, snugly surround the entire spinal cord. This covering is important in that it tends to prevent absorption by the cord substance of any injected drug, and that it carries the main arterial supply to the cord itself. One must visualize this arterial network when doing a spinal puncture, for any reason, above the second lumbar vertebra (third lumbar in children, Fig. 1-B).

The spinal arachnoid, the third covering of the spinal cord, is a thin, delicate and tubular membrane loosely investing the cord. It contains neither vessels nor nerves, and is separated from the pia mater by a comparatively wide space, the subarachnoid space, so commonly referred to as the spinal canal (Fig. 1-A). This space is of tremendous importance in spinal anesthesia. It contains the circulating spinal fluid, the unsheathed spinal nerve roots, ligaments, blood-vessels and lymphatics, and is the receptacle into which the anesthetic drug must be deposited. The subarachnoid space is divided into an anterior and posterior chamber by the two ligamentia denticulata. These ligaments are distinct fiberous bands extending throughout the entire length of the spinal cord, separating the anterior and the posterior spinal nerve roots. While the median borders of these ligaments are continuous with the pia mater at the side of the spinal cord, their lateral border presents triangular tooth-like processes, the points of which are fixed at intervals to the arachnoid and dura mater, providing a certain amount of communication between the two chambers (Fig. 2).

There are two other but less well-defined ligaments of the spinal cord, the linea splendens in front and the septum posticum behind. These ligaments are cribiform reflections of the pia mater, their development varying in different individuals, and are, as a rule, much more distinct in the lower than in the upper portion of the cord. The spinal cord ligaments are important in that they sometimes influence an unequal diffusion of the anesthetic drug which may result in a more pronounced anesthesia on one side than on the other. If the anesthetic solution should diffuse mostly in the posterior chamber, which contains the posterior or sensory nerve roots, its anesthesia would very likely be complete while motor function, which is invested in the anterior nerve roots, would remain in evidence. Not infrequent-

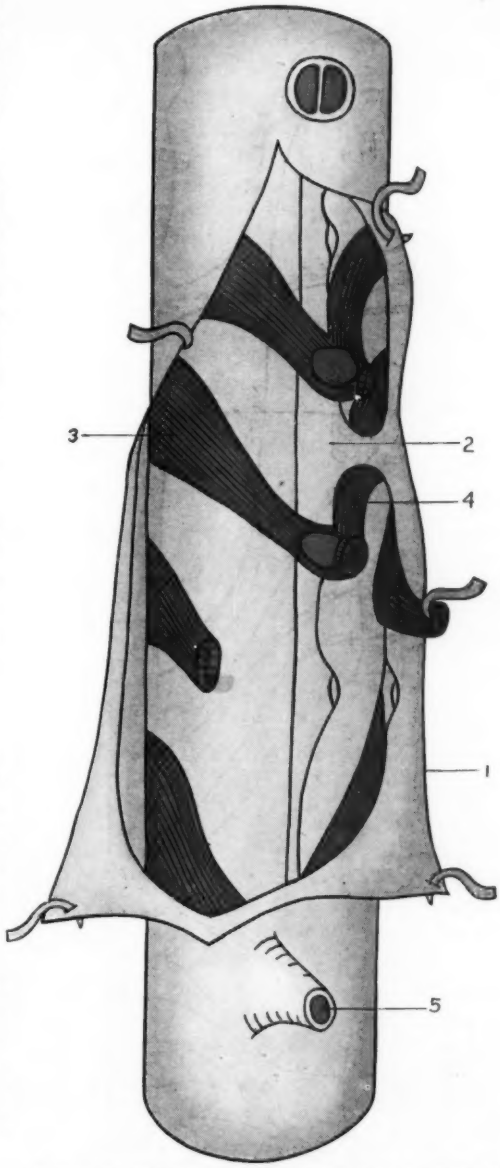

FIGURE 2. Diagramatic representation of a section of the spinal cord and dura mater showing the (1) dura opened; (2) ligamentum denticulatum; (3) posterior and (4) anterior spinal nerve roots; (5) a spinal nerve after the two roots have united and taken on the dura as its sheath (epineurium). (Grey's Anatomy).

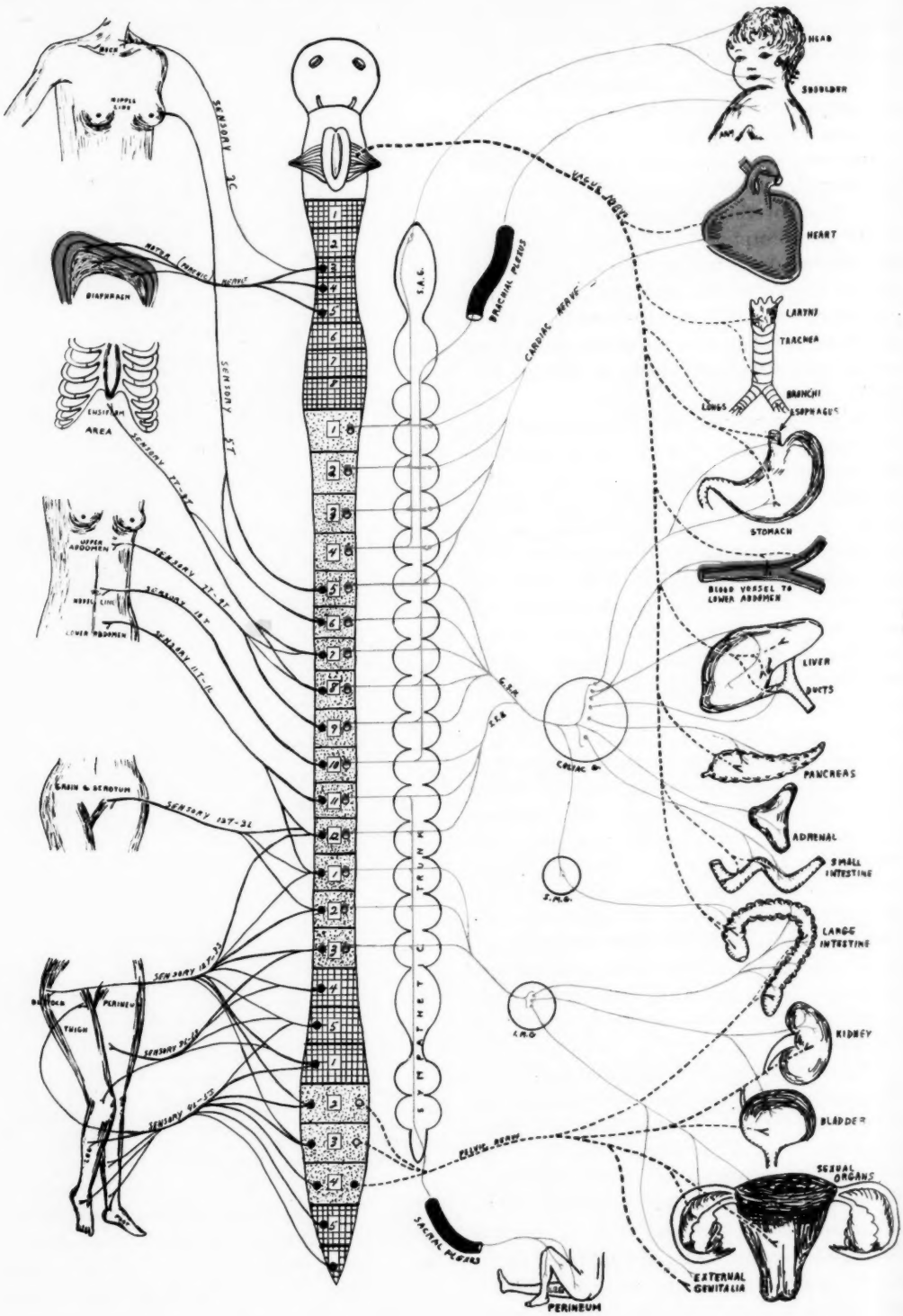

FIGURE 4. Diagramatic illustration of that portion of the central, sympathetic and parasympathetic nervous system involved in spinal anesthesia (modified from Evan's Spinal Anesthesia).

ly good anesthesia is obtained in a patient who at the same time is able to move his feet and legs. Also if the bevel of the spinal puncture needle happens to be against one of these ligaments the free flow of spinal fluid may be interfered with and aspiration of the fluid be prevented.

The spinal dura mater is the fourth and most important of the coverings of the cord. Comparatively it is a thick and tough membrane which must be punctured at some point before spinal anesthesia can be induced. The spinal dura is continuous above with that of the brain and extends as far downward as the second sacral vertebra. Spinal puncture is almost always done in the lumbar region and although the dura is larger here than elsewhere it contains the cauda equina and every effort must be used to avoid injury to this important nerve structure. On each side of the dura are the double openings which transmit the two roots of the corresponding spinal nerves, the dura being continued in the form of tubular prolongations around them as they pass through the intervertebral foramina (Fig. 2). The dura is separated from the bony wall of the vertebral canal by the epidural space which contains fat, a quantity of loose areolar tissue and a plexus of veins. It is important to visualize the epidural space in doing spinal puncture for any reason. One should be able to differentiate the loss of needle resistance in this space from that in the subarachnoid space so that the stylet of the needle will not be removed until the latter's bevel has entered the subarachnoid space.

There are thirty-one pairs of nerves which spring from the spinal cord, each nerve being firmly attached to the cord by an anterior motor and a posterior sensory root, the latter always being distinguished by its ganglion. After the two roots unite each spinal nerve takes on its sheath, the epineurium, and makes its exit through its own intervertebral foramen.

The autonomic nervous system, which is both extensive and complex, consists of three principal divisions, commonly known as the sympathetic, parasympathetic and enteric nervous systems. The latter comprises that system of nerves forming the plexuses of Auerbach and Meissener in the walls of the stomach and small intestine. Very little is known regarding either the anatomical connection with the central nervous system or the peculiarities of their functional activity, and they are, therefore, of no known importance in so far as spinal anesthesia is concerned.

The two main divisions, however, the sympathetic and parasympathetic have definite connections with the central nervous system and their anatomical distribution, physiological function, and pharmacological reactions are quite well understood.

The sympathetic autonomic system has its connection with the central nervous system through small communicating branches, the rami communicantes. Sympathetic autonomic nerve fibers are known to emerge from the spinal cord in the anterior roots of the spinal nerves from the first thoracic to the third or fourth lumbar. These fibers pass by way of the rami communicantes to the chain of sympathetic ganglia and thence to all regions of the human body (Fig. 4).

All sympathetic autonomic fibers going into the sympathetic ganglia are termed pre-ganglionic fibers or white rami. The white rami contain the vasomotor fibers that go to make up the innervation of the entire vascular system. The vasomotor fibers that are destined to supply the peripheral blood-vessels leave the sympathetic ganglia now as post-ganglionic fibers or gray rami, return through the rami communicantes to the spinal nerves and are then distributed to their respective regions (Fig. 5). On the other hand the vasomotor fibers destined to supply the great vascular regions of the intestine and other abdominal viscera leave the sympathetic ganglia, still as pre-ganglionic fibers, in the branches of the splanchnic nerves and through them pass to the celiac and superior mesenteric ganglia where they mainly terminate, their paths being continued by post-ganglionic fibers arising from these ganglia (Fig. 6).

The sympathetic autonomic system also supplies the heart with its accelerator nerve fibers. These fibers emerge from the spinal cord in the anterior roots of the second, third, fourth, fifth and sometimes the sixth thoracic spinal nerves, pass to the stellate or first thoracic and inferior cervical ganglia, thence to the heart through the cardiac plexus (Fig. 7).

The para-sympathetic autonomic nervous system is connected with the central nervous system at its two ends, with the brain above through the tenth cranial or vagus nerve, and with the sacral segments of the spinal cord below through the nervous erigens or pelvic nerve (Fig. 4). The vagus being a very extensive and complex nerve, only such portions of it as play a part in the various phenomena incident to spinal anesthesia

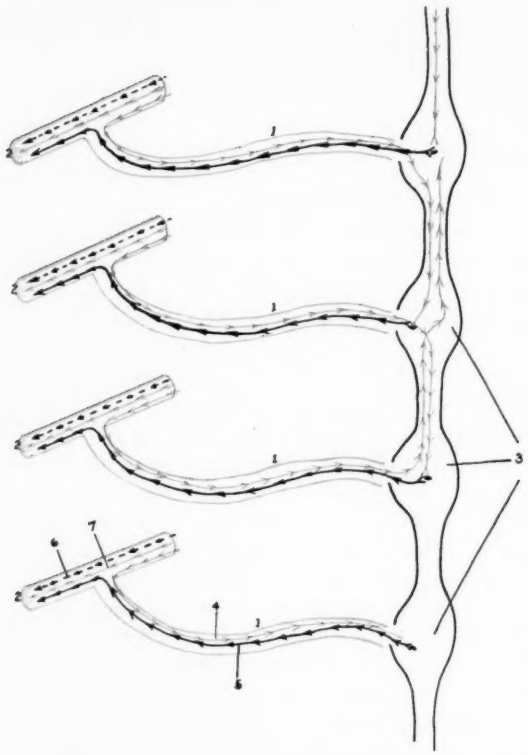

FIGURE 5. Diagramatic representation of the rami communicantes connecting the central nervous system with the sympathetic nervous system. (1) Ramus communicans. (2) Spinal nerve. (3) Sympathetic ganglia. (4) Preganglionic fibers. (5) Post-ganglionic fibers. (6) Motor fibers. (7) Sensory fibers.

will be considered. It takes its origin in the medulla oblongata and passes downward through the neck and thorax, and ends in the abdominal cavity. In the neck the vagus gives off the superior, middle and inferior cardiac branches. These branches, containing inhibitory fibers for the heart, enter into the formation of the anterior and posterior cardiac plexuses (Fig. 7).

In the thorax the vagus nerve gives off two or more pulmonary branches. These branches, containing motor and sensory fibers for the bronchi and lungs, enter into the formation of the anterior and posterior pulmonary plexuses. In the abdomen the vagus terminates in the celiac plexus from which it sends motor fibers to the stomach, small intestine, cecum and ascending colon (Fig. 6).

As stated above, the parasympathetic system is also connected with the central nervous system at the lower end of the spinal cord through the pelvic nerve. This nerve gets its origin from the second, third and fourth sacral segments and independent of the sympathetic ganglia it passes directly to and takes part in the formation of the pelvic plexus. The pelvic nerve supplies motor fibers to the colon, sigmoid, rectum and anus (Fig. 4).

Diffusion of the Anesthetic Drug

The success of spinal anesthesia depends largely upon the fact that the extent and duration of anesthesia can usually be adjusted to accomodate the needs of the various surgical procedures. This anesthesia is obtained by blocking the posterior sensory roots of the spinal nerves. Therefore to obtain the necessary anesthesia one must cause the anesthetic drug to diffuse in the subarachnoid space sufficiently high and in sufficient concentration to block the corresponding nerve roots. There is a selective affinity between these unsheathed sensory nerve roots and the anesthetic drugs of the novocain group, and when such a drug is introduced into the subarachnoid space there is diffusion both toward the head and towards the sacrum regardless of the position of the patient. The nerve roots become highly saturated and there is a rapid fixation of the anesthetic drug by the lipoids of the nerve tissue. This action is greatest at the point of first contact and unless special factors are brought into play, diffusion of the anesthetic drug will tend to be small and anesthesia will be limited.

Increased diffusion, giving a higher level of anesthesia, can be produced when the spinal fluid pressure is reduced by withdrawing a greater quantity of the fluid. If the spinal fluid pressure is greater than normal at the time of injection of the anesthetic drug, all other factors being equal, the diffusion of the drug will be appreciably decreased. On the other hand, if a sufficient quantity of spinal fluid is withdrawn to greatly lower its pressure immediately before the injection of the drug, the extent of diffusion will be appreciably increased.

A part or all of the withdrawn spinal fluid is used for the solvent of the anesthetic drug, nothing else being added. The amount of the drug used and the force used in reinjecting the solution also plays a part in the extent of diffusion. The combination of lowering the spinal fluid pressure, increasing the size dose of the drug used, using the fluid for the solvent agent, and force used in the injection are the most powerful factors we

have at hand in producing the greatest amount of diffusion and the highest level of anesthesia. Withdrawal of only a c.c. or two of fluid, the use of a small dose of the drug, and a very slow reinjection will give low anesthesia of short duration. By withdrawing a large quantity of fluid with lowering of the spinal fluid pressure, employing a maximum dose of the drug, and a rapid and forceful injection, one can produce anesthesia even as high as the scalp.

Position of the patient seems to have but little, if any, influence on the extent or direction of the diffusion. To lower the head of the patient does not seem to increase the diffusion in that direction even the slightest and I believe one is very likely to invite disappointment if he depends on the position of the patient to provide any increase in directional diffusion. It is true that when novocain is dissolved in spinal fluid, to which nothing else is added, the specific gravity of the solution will be slightly increased but, practically, this increase becomes negligible as the solution is mixed with the spinal fluid in the subarachnoid space. Furthermore, the nerve roots absorb the anesthetic drug almost the instant the two come in contact with each other, and it is a matter of only a few minutes until none of the drug remains in the fluid. Thereafter the position of the patient means nothing insofar as diffusion of the drug is concerned.

The Drop in Blood Pressure

It is common knowledge among the profession that spinal anesthesia produces a sudden and considerable drop in blood pressure. It is this drop that carries with it actual fear in those who are not wholly familiar with the physiology of such a sudden lowering of the blood pressure and who are uncertain as to the management of a patient through this short period of sudden circulatory disturbance.

Normal blood pressure is maintained largely by the action of the vasoconstrictor nerve fibers which keep the blood vessels in constant tonic activity. These vasoconstrictor fibers emerge from the spinal cord in the anterior roots of the spinal nerves from the second thoracic to the second or third lumbar. If these fibers are cut, or if they are blocked with an anesthetic drug, the drop in blood pressure will reach its maximum. But in ordinary spinal anesthesia the anesthetic drug does not diffuse high enough nor in sufficient concentration to block the nerves as high as the second thoracic. However, in the majority of cases the drug will diffuse high enough to block a part or all of the vasoconstrictor fibers leading to the great vascular regions of the intestine and other abdominal viscera. These vasoconstrictor fibers emerge from the spinal cord in the anterior roots of the spinal nerves from the sixth thoracic to the first lumbar, pass by way of the corresponding sympathetic ganglia into the greater and lesser splanchnic nerves, thence to the celiac and superior mesenteric plexuses. If these splanchnic nerves are severed the blood vessels of the splanchnic area lose their tone and dilate, pooling the blood from other parts of the body with the result that peripheral arterial blood pressure drops to a very low level.

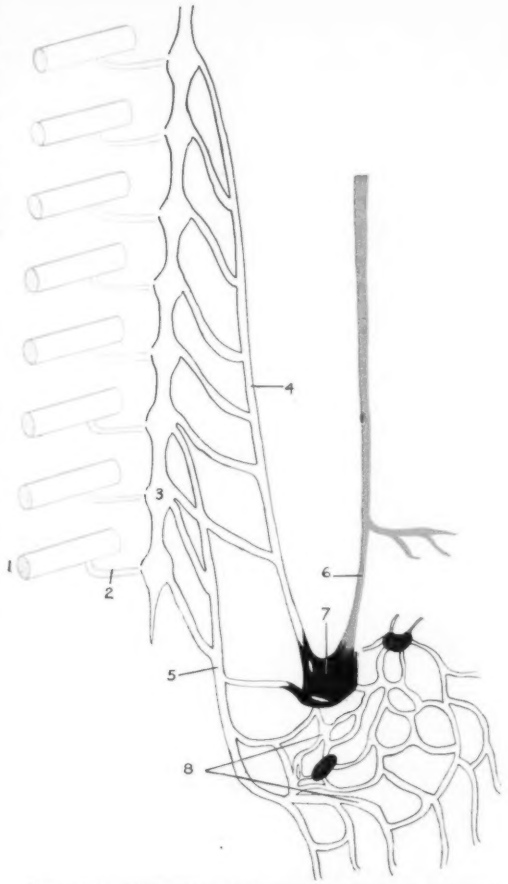

Figure 6. Illustrates the formation of the greater and lesser splanchnic nerves by small branches arising from the sympathetic ganglia. (1) Spinal nerve. (2) Ramus communicans. (3) Sympathetic ganglia. (4) Greater splanchnic nerve. (5) Lesser splanchnic nerve. (6) Vagus nerve. (7) Celiac ganglion. (8) Celiac plexus.

This proves conclusively that the constant tone of the blood vessels in the splanchnic area alone plays a predominant part in the maintenance of normal blood pressure. Therefore, if the anesthetic drug diffuses up to the sixth thoracic spinal nerves in sufficient concentration to block all the vasoconstrictor fibers up to that point, the splanchnic blood vessels lose their tone and dilate with the result that peripheral arterial pressure drops in the same manner as if the splanchnic nerves were severed.

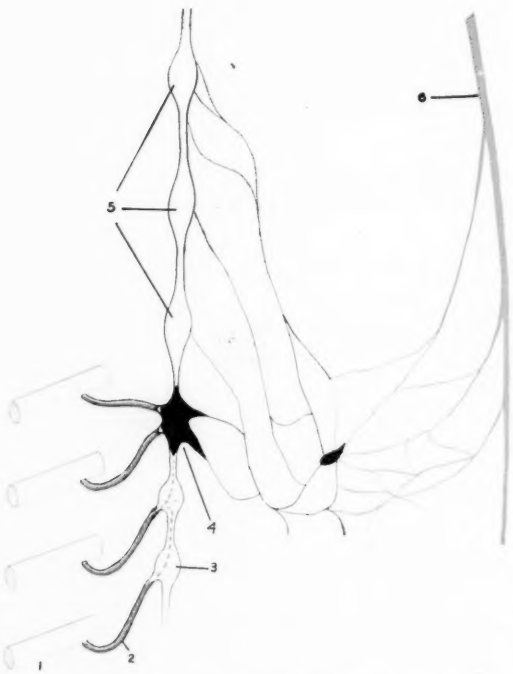

FIGURE 7. This drawing illustrates the formation of the cardiac plexus. (1) Spinal nerve. (2) Ramus communicans. (3) Sympathetic ganglion. (4) Stellate ganglion. (5) Superior middle and inferior cervical ganglia. (6) Vagus nerve with its three cardiac branches.

The drop in blood pressure will vary from 10 m.m. hydrg. to 70 m.m. hydrg., depending on the extent of diffusion of the anesthetic drug and the proportion of vasoconstrictor fibers involved. Occasionally the drop in blood pressure will be so great that an accurate reading can not be made and the radial pulse may become imperceptible. Ordinarily the gravity of such a situation would seem alarming, but it is only apparently so in spinal anesthesia, for the patient can be made quite safe if he is not mismanaged or overmanaged.

One must always remember that in spinal anesthesia with the splanchnic blood vessels toneless and dilated, the circulatory disturbance becomes a question of gravitation of the blood to the dependent portions of the body. Consequently some of the peripheral arteries, particularly those in less dependent portions of the body, become impoverished. Therefore the brain which contains the cardiac and respiratory centers must be made a dependent portion so that it will not be drained of its blood, and a fatal cerebral anemia allowed to occur. This can best be done by placing the patient in a slight Trendelenberg position. No one can foretell how much drop in blood pressure a patient is going to have, and remembering that in the arterial system of the brain the ganglionic system and the long branches of the cortical system are terminal arteries, the brain should be made a dependent portion before any drop in blood pressure occurs, for the simple reason that these terminal arteries neither give off nor receive anastomotic branches; their walls are not supported by muscle tissue or aponeurosis and contain no elastic or contractile fibers. When these vessels become impoverished they collapse and once collapsed they usually remain so and the patient's life is endangered. So one should not make the serious mistake of waiting to see if the patient is going to have a sufficient drop in blood-pressure before placing him in a slight Trendelenberg position. The latter should be done within a few minutes after the anesthetic drug has been injected.

When death, due strictly to the anesthesia method, occurs in spinal anesthesia cases, it is not due to the toxic effect of an average dose of the anesthetic drug, nor is it due to paralysis by high diffusion of the latter, a common and erroneous belief. Death in such cases is due to cerebral anemia.

THE HEART

While I have stressed the importance of constant tonic activity of the blood vessels in maintaining normal blood pressure, the power of keeping up this pressure is invested in the heart, and if blood pressure is to be maintained within normal limits, even under ordinary conditions, there must be a certain amount of cooperation between the blood-vessel tone and the tonicity of the heart. Everyone is familiar with the clinical picture of a slowed heart-rate following the rise in blood pressure to a high level. Under such

conditions a slowing down of the rate tends to keep the pressure down and save the heart from overwork. Everyone is likewise familiar with the well-known acceleration in the heart-rate that follows when blood pressure drops to a low level. Such a picture is always seen during shock or following severe hemorrhage. This acceleration is an effort on the part of the heart to raise blood pressure back to normal.

In order that the heart may be kept in a more powerful and constant tonic activity, and in order that it may respond more quickly and smoothly to whatever demands are made upon it by variations in blood pressure, nature has placed this organ under two separate and distinct motor influences; namely, the inhibitory innervation and the accelerator innervation. You will recall that the inhibitory nerve fibers of the heart are supplied through the tenth cranial or vagus nerve and that the accelerator nerve fibers leave the spinal cord in the anterior roots of the second, third, fourth and fifth thoracic spinal nerves. If the vagi are severed the heart-beat increases to a very rapid rate, while if the accelerator nerves are severed the heart-beat is slowed down to a very low rate. Then one must conclude that under normal conditions the heart muscle is under the constant control of these two antagonistic influences.

In spinal anesthesia, particularly in high spinal, where the anesthetic drug diffuses high into the thoracic region, some of the accelerator nerve fibers to the heart are going to be involved. On the other hand the anesthetic drug never diffuses sufficiently high to involve any of the inhibitory fibers of the vagus nerve. Therefore, the inhibitory influence of the heart is left to work, not all together but partly, unopposed, and a slow heart-rate is the result in spite of the fact that the blood pressure may be at a low level. In fact, it is the patient in whom the heart-rate has been made the slowest, by high diffusion of the anesthetic drug, who has the lowest blood pressure, for the simple reason that if the drug has diffused to the accelerator fibers to the heart then all of the vasoconstrictor fibers to the splanchnic blood-vessels will have been involved in the block; consequently, a low blood pressure and a slow and feeble pulse result. It is in this situation that even one who is experienced in the management of spinal anesthesia patients, finds it most difficult to refrain from the use of the so-called heroic cardiac stimulants. The heart is not in need of stimulation, however, for it is doing its work with ease (slow rate, decreased peripheral resistance, and with perfect rhythm). What more could one ask? If one could only remember to leave the heart alone and concentrate on prevention of cerebral anemia, his patient will not die from cardiac failure. Theoretically this is true and practically it has proved to be 100 per cent correct in my own experience.

Respiratory Phenomena

The respiratory behavior during spinal anesthesia is frequently so altered from the normal as to appear to be approaching respiratory failure. This apparent danger has been the source of much unfavorable comment, particularly by those who really believe that death from this method of anesthesia is due to paralysis of the respiratory apparatus. This latter hypothesis is certainly an untenable one in face of the overwhelming evidence to the contrary.

You will recall that the nervous mechanism of respiration is widely distributed in the brain and spinal cord. One of the most important of the motor nerves of respiration is the phrenic, which originates from the 3rd, 4th and 5th cervical spinal nerves and supplies motor and sensory fibers to the diaphragm. The vagus nerve, which originates in the medulla oblongata supplies motor and sensory fibers to the larynx and bronchi, and to the lungs themselves. The nerve accessorious and branches from the cervical and brachial plexuses innervate the muscles of the neck and shoulder which are concerned in inspiration, and the intercostals innervate the muscles of the thorax and abdomen. All of these muscles belong to the skeletal group and are more or less under voluntary control. Under normal conditions, however, this entire respiratory apparatus works rhythmically without voluntary control, due to the automaticity of a respiratory center in the medulla oblongata.

In spinal anesthesia the only part of the nervous mechanism of respiration directly affected by the anesthetic drug is the innervation of the abdominal and lower intercostal muscles. The loss of motor power of these muscles is of little consequence as the patient is well able, at any stage of the anesthetic, to take deep and prolonged inspirations. Not infrequently the phrenic nerve is severed as a therapeutic measure, such as in tuberculosis, and these patients experience no

unusual difficulty in maintaining respiratory movements. I have seen anesthesia produced well above the nipple line and I have yet to see a patient who could not move the diaphragm at will. I can see no logical reasoning in the belief that spinal anesthesia ever produces paralysis of the respiratory apparatus.

The slow and shallow respiration frequently seen in spinal anesthesia is thought to be under the control of the respiratory center. This center is essentially automatic, although very sensitive to reflex stimulation. Heat, cold, fear, pain and emotion are some of the reflex stimuli that tend to increase the rate and force of respiratory movements.

The automatic stimulus of the respiratory center is believed to originate from the gases in the blood. In fact, experiments have proved conclusively that the condition of the gases in the blood has a direct and marked influence upon the activity of the respiratory center. If for any reason the blood supplying the center becomes more venous than normal, the respirations are increased in force or rate, or both. On the other hand, if the blood supplying the center is more arterialized than normal, the center acts more feebly and the respirations are decreased in force or rate, or both.

In spinal anesthesia the reflex and automatic stimuli are eliminated to a great extent. With the preliminary narcosis the patient is made drowsy and more or less unconcerned, with the result that fear and anxiety are reduced to a minimum. With the greater portion of the skin surface anesthetized the reflex stimuli of heat and cold are practically nonexistent. Furthermore, with the body motionless and with the greater portion of the motor and sensory functions paralyzed, general body metabolism is carried on at a slower rate. The demand for oxygen is less, the production of carbon dioxide is decreased, the circulation of the blood is slower, and the blood appears normally arterialized at all times. Consequently, there is not the demand for a more rapid interchange of the gases of the blood. Therefore, the respiratory center regulates the respiratory movements according to the needs of the body at that particular time. The shallow inspiration is further emphasized by the loss of motion of the abdominal and lower intercostal muscles, as the external appearance does not give one a true picture of the actual amount of respiratory motion within.

Respiratory failure can and does occur, but remember that it is brought about by allowing the brain to be drained of its blood, and not by the paralyzing effect of the anesthetic drug or the innervation of the respiratory apparatus.

Gastrointestinal Phenomena

Although the entire gastrointestinal tract is involved in spinal anesthesia, the changes that are brought about are not objectionable, with the exception of occasional nausea and vomiting and a possible involuntary stool, and are conducive to ease and rapidity with which the operative procedure can be carried out.

You will recall that the innervation of the gastrointestinal tract is supplied from the medulla oblongata through the vagus, and from the spinal cord through the pelvic and the greater and lesser splanchnic nerves. The vagus supplies the stomach, small intestine, cecum, ascending colon and a portion of the transverse colon with motor fibers. The remaining colon including the anal sphincter receive their motor fibers from the 2nd, 3rd and 4th sacral segments through the pelvic nerve. The entire gastrointestinal tract receives its inhibitory fibers from the spinal cord through the sympathetic autonomic fibers in the lower seven thoracic and upper three lumbar segments. Therefore, with spinal anesthesia induced sufficiently high for intra-abdominal operation, the motor nerves to the lower colon and anal sphincter and the inhibitory nerves to the entire gastrointestinal tract, are paralyzed. On the other hand, the vagus nerve is never involved and its motor fibers in the abdomen are left unopposed in their activity. Consequently, peristalsis is increased and the lumen of the small intestine is markedly contracted. These contracted intestines do not protrude through the operative incision, rather they fall away and abdominal packs are seldom necessary.

The actual cause of the occasional nausea and vomiting incident to spinal anesthesia can not be attributed to any specific factor and is very likely due to a multiplicity of intrinsic and extrinsic stimuli. It is observed more frequently, however, in the female. Nausea and vomiting is seldom observed in the male, either during or following the anesthesia. The preoperative condition of the patient seems to have no bearing on either the time, duration or severity of the

nausea. A patient who has suffered with nausea and vomiting daily for weeks may go through the entire period of anesthesia without the slightest signs of nausea, while one who has had no signs of nausea previously may vomit soon after anesthesia is induced. Not infrequently the sudden and rapid moving of the patient from one position to another excites nausea and vomiting where otherwise the patient would not have been nauseated at all. However, when nausea and vomiting do occur, it is of short duration and is of no consequence.

With the motor activity of the intestine and upper colon increased and with the lower colon paralyzed and the anal sphincter markedly relaxed a condition favorable to the explusion of gas is created. Even an involuntary stool is not unlikely, although this has never occurred in my own experience. It is upon this basis, however, that spinal anesthesia is sometimes recommended as a therapeutic measure in certain types of ileus.

THE USE OF RADIUM IN THE TREATMENT OF UTERINE HEMORRHAGE*

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Uterine hemorrhage is not a disease. It is not a pathological entity. It is merely a symptom of many pathological conditions; most of them local, some of them general.

With this varied etiology there is manifestly no specific routine treatment for this symptom. As these causal factors vary, one from the other, so must our treatment vary. Recognition of the causal factor in each case is the first essential.

Before discussing the value of radium in treating uterine hemorrhage we must briefly review the more important conditions in which this symptom occurs. As a working classification we may distinguish the following groups:

First, Conditions associated with pregnancy. Under this head come placenta praevia, abortions, threatened and complete, retained membranes, uterine tears, extra-uterine pregnancies, etc.

Second, Uterine neoplasms. Tumors, malignant and benign, both of cervix and of fundus.

Third, Functional or idiopathic hemorrhages, occurring both at puberty and at the menopause.

Less frequent causes are, inflammatory conditions of pelvic organs; metritis, endometritis, salpingitis and general pelvic inflammatory disease. These infections may be gonorrheal, septic, tuberculous, etc. Also uterine displacements, often with subinvolution; neoplasms, both malignant and benign, of tubes or ovaries. Finally as causal factors we must mention certain general constitutional conditions, such as diabetes, renal and heart conditions, acute infectious disease, anemia, etc.

It is clear at first sight that radium treatment would be of no value in many of these types. We can at once bar out its use in the obstetrical group. Retained membranes should be removed, lacerations repaired, and other various surgical procedures carried out as indicated.

In treatment of hemorrhages associated with inflammatory conditions the case is not quite as clear. In the early days of radium therapy the rays were supposed to have a sterilizing effect. Hence it was argued that inflammatory conditions would be benefited by their use. This idea still lingers, apparently, in the minds of many of our profession. It is incorrect. Radium rays do not sterilize. They do not inhibit bacterial growth. They do not reduce inflammation. The initial effect of radiation is a stimulating action. Preexisting inflammations are not reduced by it but are, on the contrary, frequently made worse. Especially is this true in acute conditions. While often times in chronic conditions, such as chronic salpingitis, no bad results may be obtained; at other times this stimulating effect seems to stir up the quiescent condition and we have an acute inflammatory reaction as the final result of our treatment.

Therefore, these uterine hemorrhages which are the symptoms of pelvic inflammatory processes are not amenable to radium therapy. On the other hand in such conditions this therapy is absolutely contraindicated.

In neoplasms of tube or ovary, radiation is not, as a rule, the best treatment. While it might frequently relieve the hemorrhage, such a result is not what we are aiming at. Treatment directed toward initial cause is here of paramount importance. Operative removal, therefore, is the treatment of election in ovarian and tubal new growths, both malignant and benign, and radiation is reserved for those cases in which, for one reason or another, surgery is barred out.

The case with hemorrhage in uterine displacements is somewhat similar. Although we

*Read before the 56th Annual Meeting of the Florida Medical Association, St. Augustine, April 2, 3, 1929.

may by radiation stop the flow and possibly, as an end result, reduce the sub-involution, the displacement will still remain, with whatever chain of symptoms it had originally caused. Radiation may be used as an auxiliary treatment to some extent in many of the cases, but the most important part of the treatment are these measures which we use toward the reduction of the displacement.

When hemorrhage occurs as a result of general constitutional conditions radium radiation can only be used in these few cases in which the flow is so great that it demands especial attention in addition to the treatment directed towards the initial lesion.

This leaves us then the following classes which we may discuss as amenable to radiation. Cancers of the uterus; myomatous tumors of the uterus; functional or idiopathic uterine hemorrhage. We will consider the classes in order.

Cancer of the Uterus—We are considering, this afternoon, not the ultimate results which may be obtained as regards the permanent cure of this condition. Our attention is directed only to the effects which the treatment may have upon the symptom of hemorrhage.

I have been able to follow up 190 cases of uterine cancer which I have treated with radium between September, 1920, and December 31, 1928. While the period of time which has elapsed since the treatment of the last patient has been too short to allow any conclusions as to the ultimate effects on the cancer, it is long enough to give us some idea as to the immediate results upon the more important symptoms.

In my cases bleeding was relieved in 163, over 80 per cent of the total. Discharge was relieved in 70 per cent, while pain was relieved in a little less than 60 per cent. These statistics are about the same as those reported by other observers.

It is pertinent to note that this series embraces uterine cancer cases of all degrees of severity, the very early as well as the most advanced. Failures to relieve hemorrhage occurred without exception in the more advanced cases. Palliative radiation in the early cases, therefore, should give relief from hemorrhage in practically every case.

This hemorrhage is controlled by the natural regression which takes place when a rapidly growing mass of cancer cells is exposed to a lethal dose of radium. Cancer cells are more easily poisoned by radiation than are normal tissue cells. (Hence the so-called selective action of radium rays.) The nuclei of the cells disintegrate, the protoplasm breaks down, the detritus is carried away, the vessels sclerose and finally become obliterated. Connective tissue grows in to replace the destroyed cancer tissue, and ultimately we have a firm sclerotic connective tissue scar in the place formerly occupied by the neoplasm. These changes are, of course, gradual; the final scar not forming until many months after the treatment. For this reason the relief of hemorrhage, due to radium action, is not immediate. Such cessation does not begin until about ten days or two weeks after treatment. Until this occurs hemorrhage should be controlled as necessary by packing, with judicious use of Monsel's solution or other hemostatic.

Bleeding may return if there is a recurrence of the cancer locally. In my experience this has been rare. When the initial radium treatment fails to eradicate the cancer the recurrence is usually in the glands or the parametria. The original site of the cervical growth is much less frequently involved.

Uterine Myomata—The degree of success which the gynecologist will have in using radium to stop hemorrhage from fibroid tumor depends entirely upon the care with which he selects the cases for radiation. The majority of all fibroids are best treated by operation. About 40 per cent can and should be treated with radium. With suitable treatment in properly selected cases hemorrhage will be stopped in nearly every case. Usually one intensive treatment is sufficient. Occasionally secondary treatments are necessary.

In order that we may have a proper understanding of this treatment it will be necessary to go rather into detail regarding the type of case which is best fitted for radiation. While there are, of course, differences of opinion among gynecologists regarding some details, I believe that the composite opinion of the majority would be about as follows:

The uterus must not be larger than that of a four months' pregnancy.

The diagnosis of fibroid must be absolutely clear and the lesion must be uncomplicated. If there is a possibility that other pelvic pathology may be present laparotomy is indicated. Pelvic

inflammatory disease, acute or chronic, is an absolute contraindication.

It is best fitted for intramural growths. Radium is contraindicated in the presence of pedunculated subperitoneal nodules of any size. It is also contraindicated in large pedunculated submucous growths, especially so if they are infected.

Inasmuch as the radiation necessary is practically certain to bring on the menopause, its use should, generally speaking, be limited to women over forty.

All rules, of course, are made to be broken. These rules are no exception. Some of them, however, are far more important than others. Personally I think the first requisite, that the uterus should not be larger than a four months' pregnancy, is the least important of all. Certainly it is of minor importance when we are radiating to relieve the symptom of hemorrhage. It is true that when the fibroid is large the growth is less apt to disappear than when it is small. Burnam states that 50 per cent of the large fibroids disappear after radium radiation, while 80 per cent of those smaller than a four months' pregnancy are radically cured.

Of far greater importance than the size of the tumor is, I think, its type. If the growth be intramural, disposed along the uterine canal so that, with a long radium applicator, it can be radiated for its entire length, the prognosis, is good. But the multinodular uterus, with numerous subserous pedunculated tumors, is emphatically not the type for radiation. On account of the irregularity of the growths a proper therapeutic dose cannot be administered to all parts of the tumor. Morever, thrombosis of the vessels in the pedicle may occur as a later result of the radiation. This of course cuts off the blood supply of the pedunculated mass with a resulting necrosis and an intraabdominal sepsis.

For the same reason we must beware of those large submucous fibroids projecting down into the uterine cavity and attached to its wall by a small pedicle. These tumors are prone to necrosis at best. Thrombosis of the vessels in the pedicle occurs as it does in the case of the subserous myoma just mentioned. Necrosis and gangrene of the mass ensue. We may at times safely radiate sessile submucous growths attached to the wall over a large area. But the large growths with small pedicles should not be radiated.

Pelvic inflammatory disease as a contraindication to radiation has already been mentioned. As a general thing this rule should not be broken. However, we do occasionally have fibroid cases complicated by old adherent tubes and ovaries in which operation is for some reason contraindicated, but which must have relief from the hemorrhage caused by the fibroid uterus. Such cases may be radiated cautiously, in broken doses. But they are the few exceptions to this important rule.

Finally it is necessary to consider the question of the artificial menopause. As I have just said, radiation sufficient to stop the hemorrhage or to cure the fibroid will almost certainly bring on an artificial menopause. As a rule then, it should be confined to women past or near the time of the natural menopause. But naturally each case must be judged by itself. With younger women, exhausted by bleeding which cannot be controlled, in whom the operative risk would be great, we are justified in using radiation. But the patient must understand fully the results which will be obtained and must freely consent herself to this line of treatment.

Uterine Hemorrhage of Benign Origin Without Gross Pathological Lesions—Under this heading I include those cases of menorrhagia or metrorrhagia which on examination show no marked deviation from the normal. Admittedly, from the pathological standpoint, a number of different types are included. Many of them are manifestly endocrine in origin, especially that type which we often find at puberty.

Others of them are associated with subinvolution alone or subinvolution with displacements of greater or less severity. Still others are evidently due to microscopic changes in the endometrium, blood vessels or musculature of the uterus. Numerous classifications have been attempted by various men, none of them, however, entirely satisfactory.

Practically all hemorrhages of this type can be stopped by radium radiation. But whether or no this treatment is the best for an individual case can only be determined after a careful analysis of that case.

Certain fundamental principles already mentioned must be noted. We must remember that heavy radiations bring on the menopause. There-

fore, when all other measures have failed in younger women and radical treatment is indicated it should be carefully considered whether or not supravaginal hysterectomy with preservation of the ovarian function is not preferable. Usually it is. Sometimes in these young women, especially in those endocrine menorrhagias at puberty, a mild radiation may be given which will cause a temporary amenorrhoea with the hope that when the periods re-establish themselves they will become normal. This type of radiation is unsatisfactory. One is between the devil and the deep blue sea. Too much radiation will bring on the menopause; too little will not cure the trouble. Certainly one may say that in young women such radiation should never be attempted until all other therapy has been exhausted, and not then unless there is a definite understanding on the part of the patient of the uncertainty of the method and the possible bad results that may ensue.

Again we must be absolutely certain of our diagnosis. Careful examination under an anesthetic should precede the treatment. This should always include a curettage with examination of the scrapings by a competent pathologist in order that we may rule out malignancy. If no contraindication to treatment is to be found the radium can be immediately introduced into the cavity of the fundus, thereby avoiding a second anesthetic.

Any pathology of the tubes or ovaries which is revealed at this time is a contraindication to radiation. A quiescent gonorrheal pelvic inflammatory disease, with adherent tubes, is the complication most frequently found at this time. Radiation in such a case might light up the dormant inflammatory process and bring on a severe attack of pelvic peritonitis.

Backward or downward displacements of the uterus are not contraindications to radiation although the case should be studied to see whether a subtotal hysterectomy would not be the operation of choice.

Results of this treatment in properly selected cases in women at the time of the menopause are most excellent. The radiation dosage should be sufficient to bring on the menopause. I do not think that the symptoms of the menopause caused by radium are any more severe than the natural menopause would be in the same woman. I am certain that they are less severe than those which occur after the surgical removal of both ovaries.

The treatment, as a rule, is not especially painful. The presence of the radium capsule in the fundus of the uterus often sets up uterine contractions which, in some women, may be painful. In others the gauze packing which must be placed in the cervix and vagina causes discomfort. In many of these cases there is a marked nausea caused by the radiation. This usually comes on about six or eight hours after radiation is started, may be extreme for a while, but usually subsides before the radiation is over.

The effect on the uterine bleeding is not immediate. There is a latent period after each treatment before the actual effects begin to take place. Then the radiation effects continue for several weeks. If given shortly before a period is due that period will take place and probably be even more profuse than normal. A second slighter period appears in some cases. After that the menopause is established in the great majority. Secondary radiations should be necessary in very few cases, provided the original diagnosis had been correct and the treatment technically satisfactory.

If radium was of use only in these cases of essential uterine hemorrhage it would still have to be considered one of our most valuable therapeutic agents. This method which requires but a few days hospital detention, a light gas anesthesia, and involves at worst a moderate amount of pain, takes the place of hysterectomy, and that in patients whose general condition often times would make the major procedure one of grave operative risk.

Conclusions

1. Radium treatment for uterine hemorrhage is indicated only in certain types of uterine cancer, myomata, and essential hemorrhage.

2. Relief from hemorrhage may be expected in approximately 80 per cent of all types of uterine cancer.

3. In the early and moderately advanced types of uterine cancer, cessation of hemorrhage may be expected in nearly all cases.

4. The majority of all cases of myomatous uteri should be operated upon. About 40 per cent of all of them are suitable for radium treatment.

5. In carefully selected cases of fibroids relief from hemorrhage should be obtained in nearly every case.

6. Similar results should be obtained in properly selected cases of essential hemorrhage.

7. A careful gynecological examination and thorough analysis of the case should be made in every instance when radium treatment is considered.

8. Radiation is not indicated in the presence of pelvic inflammatory disease, acute or chronic. Neither is it indicated when any tubal or ovarian pathology of major type is present.

9. As a general rule it should be employed only in women who are near the time of the menopause or who have passed that time.

DISCUSSION

Dr. W. M. Rowlett, Tampa:

In addition to congratulating Dr. Holden upon his splendid paper, I was greatly impressed with the modesty and frankness in which he has dealt with his subject. As a rule I find an overenthusiasm seizes the physician who is doing some special work. With Dr. Holden, he seems to have substituted his enthusiasm with an appalling frankness.

I do not believe that there are any types of cases in the practice of medicine where the etiology is so uncertain as those of uterine hemorrhage. Naturally the treatment, especially the conservative, is uncertain. This etiological uncertainty is greatly exaggerated by the poor examination that is given the patient. A year ago a young woman, twenty-eight years of age, consulted me relative to a persistent uterine bleeding. Her family physician had examined her, diagnosed fibroid tumors, and had insisted upon a hysterectomy. Upon examination, I could not find the tumors, but instead a small bleeding vessel located in an old infected lacerated cervix; a gentle touching of the bleeding vessel with a Post cautery, at the time of the examination, brought about a permanent cure. Many similar cases I have found in my practice.

Like Dr. Holden, I believe that radium is the treatment par excellent for all uncomplicated, non-pedunculated fibroids that do not rise above the umbilicus. I should also like to stress the importance of his warning in the use of radium in pelvic inflammatory conditions. I can recall one case when an old latent salpingitis was aroused which nearly caused my patient's life, when I attempted to correct a stubborn metrorrhagia with the enter uterine application of radium. In those numerous cases of uterine hemorrhage where no definite pathologic condition can be found, and where there exists no inflammatory process, I believe radium application after a diagnostic currettage is a good routine. I have followed such a procedure and have gotten most gratifying results. However, great consideration must be given to the dosage and age of the patient.

Only last week there appeared in the JOURNAL of the A.M.A. a report on 250 cases of metrorrhagias, from benign causes, at the Free Hospital for Women, Brookline, Mass. The report stated:

"Of the 250 patients that had received local radium application, with the exception of 41 in whom a diagnosis of fibroid could be definitely made, only one had any demonstrable pathologic condition that might account for the abnormal flowing,— . . . all were well for six months to seven years after treatment. In the selected cases of uterine fibroids, radium application resulted in cure in 88.2 per cent."

Dr. Holden speaks of the selective action and the distintegration and breaking down of cancer cells after radiation. There has been nothing more discouraging than the pathologists efforts to aid us in determining the radio sensitivity of those cases, and now our best men are doubting whether there actually exists a specific radiosensitivity of cancer cells that are based on cell type. They are beginning to believe that the amenability of cancer to radium instead of being that of the cell type depend more on the relative amount of connective tissue that the tumor possesses. We have, likewise, found out that the adeno-carcinoma is very radio-resistant, but just why, they have been unable to tell us. We do know, however, that there exists in all of our patients that condition known as resistance. The amount of this so-called resistance is going a long way in determining the results of our treatment.

Dr. Frederick J. Waas, Jacksonville:

Regarding carcinoma of the cervix from a radium standpoint:

A few years ago I was very much enthused over operating these cases, and felt I was getting very good results. I remember quite well a case I considered inoperable, an elderly woman, that I referred to Dr. Holden for radium. I felt that it was a desperate case, did not feel that anything would make an impression; she was beyond 60 years of age, but I referred her to Dr. Holden. That was five years ago. Today her cervix is as

clean as the palm of the hand. It converted me very markedly toward the use of radium in carcinoma of the cervix. I am now beginning to feel rather reluctant to operate any case of carcinoma of the cervix. Have had quite a number of recurrences, and the cases referred to Dr. Holden from that standpoint, I feel have really gotten gratifying results. I have really been converted to the use of radium in carcinoma of the cervix by Dr. Holden.

Myopathic hemorrhages in young girls:

Bleeding in this group is frequently excessive, and is almost always due to endometrial hyperplasia, in fact, menorrhagia or metrorrhagia may be so excessive as to produce extreme secondary anemia. I think these cases are entitled to very serious consideration before advising radical surgery or radium. One of the happiest events in a young girl's life is looking forward to motherhood. If radical measures are resorted to, this naturally precludes the possibility of motherhood, hence, a keen disappointment to the patient. As an etiological factor the question of endocrine imbalance should be given consideration. Blood transfusion should also be considered before resorting to any radical measures.

Dr. Harry A. Peyton, Jacksonville:

We are very fortunate, indeed, to have this subject presented by Dr. Holden. It is rather unusual that we have a paper on radium treatment by one who is both a radiologist and gynecologist. It is for this reason that this communication is so conservative in its general tone. In the past we have heard too much of the advantages of radium and different claims for it which have not since been substantiated. Radium has now been in use a sufficient time for us to judge of its real value in certain diseases.

As to the indications: first, cancer of the cervix. Of course, Dr. Holden spoke from the standpoint of hemorrhage. I may digress to this extent, to say that now it is generally conceded that the use of radium in cancer of the cervix is by far the better of the two methods of treatment —the other being surgical. The end results with comparatively small mortality are all in favor of radium treatment. This, however, does not apply in carcinoma of the fundus of the uterus. In the operable cases it is much better to do surgery than to use radium where there is cancer of the fundus. In inoperable cases of cancer of the fundus, the use of radium and X-ray is indicated, and it can be used with a great deal of benefit and relief of suffering.

Our experience has been a little at variance with Dr. Holden in the percentage of myomata of the uterus favorable to radiation. I am not prepared to say exactly what the percentage is, but I am sure that it is not as high as 40 per cent. However, I agree with Dr. Holden that a myoma of the uterus in a younger woman, particularly a woman 35 to 44 years old, should be treated by means of a supra-vaginal hysterectomy rather than radiation with subsequent destruction of ovarian function. In older women (45 to 50), provided the myoma falls within the classification mentioned by Dr. Holden, or favorable to radium treatment, we find the greatest use for radium. However, I would like to sound a note of warning, and that is that radium should not be used in these patients until every means have been exhausted to exclude carcinoma—and of course that consists of diagnostic curettage and examination by a competent pathologist. The other type of myoma I think should be subjected to surgery rather than radium—that is the profusely bleeding type of myoma. We have all seen these patients bleed profusely, with a hemoglobin possibly 35 per cent or below. If we use radium in this type, we cannot expect results for some little time. In the meantime we have to control the hemorrhage. This can be controlled temporarily with packs and blood transfusion given, but where the hemoglobin is built up by these means to a safe level for operation, a supra-vaginal hysterectomy is the better way to deal with the situation.

The next type is one for which I think the future is going to hold the answer. That is the treatment of young women about the age of puberty or around 22 to 25 years old with so-called idiopathic hemorrhage. This is one of the most serious problems with which we are confronted. What to do for these young women is a serious problem. It is undesirable to give radium with the risk of bringing on a menopause, and even more so to remove the uterus and deny these young women the future possibilities of childbirth. What are we to do with them? I don't know. It certainly is a problem to work out. Certain obvious defects should be corrected, but even then there is a large number of these patients with no discoverable pathology. Recently good results have been reported from radiation

of the spleen in menorrhagias and metrorrhagias of the young. This may ultimately offer some hope.

Dr. Gerry R. Holden, Jacksonville (closing):

Just a word about bleeding in young women: Attempts have been made to handle these cases by giving radiations of low intensity, giving radium for just a few hours—a dosage which it was hoped would stop the period for a few months with the idea that when re-established they would menstruate properly. In my own hands this method has not been satisfactory. I have tried it out, but I think almost every case has been unsatisfactory. I feel very strongly against the use of radium in young women. It is far better, when we have a case of this kind, and have to do something radical, to do a hysterectomy and leave in the ovaries.

One more word about the technique of radiation: Although the technique is easy and simple, it is not a minor procedure. The same care should be given in the examination of the patient as if the case were one in which we would do a laparotomy. The procedure is carried out in the hospital under general anesthesia. The patient is first curetted and the curettings carefully examined for any possibility of malignancy. The radium capsule is introduced after curettage and treatment given.

MYASTHENIA GRAVIS—A CASE REPORT*

JOHN D. GABLE, M.D.,
Lake City.

While one can hardly say that myasthenia gravis is a disease of frequent occurrence, it is a fact that one is often called upon to take this disorder into account in the differential diagnosis of numerous other diseases, both nervous and somatic.

The unsettled question as to the cause of myasthenia gravis seems quite well illustrated by quotations from The Journal of Nervous and Mental Diseases in which periodical of August, 1928 (page 140), Arthur N. Foxe says: "Perhaps it is wise to ally our views with those of Gowers and Strumpell and see the cause in the central nervous system. That lesions have not been found constantly is no proof that they are not present. It is quite possible that our ignorance of the cause of myasthenia gravis is the same today as it was in 1902 when Gowers said, 'Thus I fear that we have not as yet found the alphabet by which these histological elements would permit us to read the story of this disease'."

In the same Journal, May, 1929 (page 530), Arie Querido of Holland concludes his summary of an excellent case report by saying: "Supported by some evidence from the literature, the hypothesis is offered that myasthenia gravis is a general vascular disease, to be defined pathologically as a perivasculitis chronica proliferous."

CASE REPORT

Patient is a white male, born in Iowa, September 6, 1885. Family history is negative. Patient had measles and mumps in childhood and, he says, no other illness until 1918 during which year he had influenza and an injury to his back. Since having influenza he thinks he has not been well at any time. He lists as his troubles since 1918 nervousness, heart trouble and back and stomach disorders.

Present Illness.—Onset was very insidious and, according to patient's statement, was variously diagnosed as hyperthyroidism, neurasthenia and psychoneurosis.

He first came under my observation January 26, 1929, at which time the diagnosis of myasthenia gravis would not have been difficult had it not already been made some six years before.

Examination showed a white male, fairly well developed, but poorly nourished. Height 69¼ inches. Weight 115 pounds. Highest weight in recent years, 124 pounds. Pulse recumbent 84, sitting 88, standing 120. Blood pressure 155/100. Kidney functional total 45 per cent. Urine showed albumen, faint trace and occasional granular cast, and was otherwise negative. Blood was negative to Wassermann test but showed non-protein nitrogen, 50. Red cells 5,400,000, white cells 4,000, and hemoglobin 70. Specialists diagnosed arrested pulmonary tuberculosis, hypertension, tachycardia, gastroenteroptosis (G. I. Series), atony of stomach, chronic colitis and chronic rhinitis.

NEUROLOGICAL EXAMINATION

Gait unsteady with flaccid swing of right leg and thigh. Deep and superficial reflexes within

*Read before the Suwannee River Medical Society, Live Oak, Jan. 10, 1930.

normal limits. General loss of strength in all muscles, the weakness being much more marked on right than left, extensor muscles stronger than the flexors, right lower limb shows a somewhat rythmical shaking movement at times. Electrical tests soon tire out almost all muscle groups but this is more decided in right lower limb.

Muscles of speech and mastication are weak. He has to stop and rest as he talks; when he laughs his lips are rigid and separate in a line and muscles of face show very little expression. When he walks some two or three hundred yards his muscles give out suddenly and he says: "If I could not sit or lie down, I would become paralyzed all over."

Some exophthalmus is present. Two basal metabolism tests showed a rate of minus 18 which was not changed by administration of thyroid substance.

Progress

From day to day he has shown very little change. Constipation is troublesome and he often complains of pain in region of kidneys.

Unlike some cases, he wakes up tired out but after having breakfast in bed, he gets up, dresses and is in good spirits until towards night again. He is cheerful and optimistic.

Intellectually, he is above the average, shows no mental deterioration nor regression and keeps up with current events. He shows about the same emotional instability as would be seen in one made as weak as he is from any other wasting disease.

Summary

The definite cause and location of myasthenia gravis are not known and there are hypotheses by some placing it in the nervous system while others suggest a vascular relationship.

In case reported the disease developed in a young man who had been healthy up to the time he had influenza and an injury to back, both in 1918. Following these, he has not been well at any time and diagnosis of myasthenia gravis was made five years after first illness and the disease has grown worse very slowly and steadily.

The questions entering one's mind are the old ones: What causes myasthenia gravis? What part, if any, did influenza play in this case? What part, if any, the injury to back?

Case has been observed for one year and will receive further follow-up.

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THE PRE-CONVENTION MEETING

The officers and Executive Committee of the Florida Medical Association announce that the annual pre-convention meeting of the officers, committeemen and councilors of the Association will be held March 6, 1930, 12:30 p. m. at the Mayflower Roof Garden, Mayflower Hotel, Jacksonville. This pre-convention meeting is for the purpose of discussing plans for the next annual meeting to be held in Pensacola in May, as well as other matters pertaining to the Association. The Scientific Program Committee will meet and select papers for the scientific program. Those members desiring to present papers at our next annual meeting should have their applications in the hands of this Committee prior to their meeting. The councilors are expected to present, in writing, their annual report. This meeting is one of the most important events in the Association during the year and all officers, committeemen and councilors are urged to attend.

MEMBERSHIP ROSTER
FLORIDA MEDICAL ASSOCIATION, INC.
CALENDAR YEAR 1930

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Andrews, E. H. .....Gainesville
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Haskell, Lyman G.,
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P. O. Box 508 .....Gainesville
King, Seeber .....Lake Butler
King, T. Byron,
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Middleton, W. E. .....Starke
O'Quinn, Charles A. .....Perry
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Preston, H. F. .....Melrose
Pridgeon, C. L. .....Waldo
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124 E. University Ave...Gainesville
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Tucker Building .....Gainesville
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103 E. University Ave., Gainesville
Thomas, W. C. .....Gainesville
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Twiggs, J. H. .....Archer
Weeks, L. R. .....Trenton
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P. O. Box 133 .....Shamrock

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Hicks, I. K., Sec.-Treas.....Melbourne
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Creel, W. J. .....Eau Gallie
Hardman, W. W., First Natl.
Bank Bldg. .....Elberton, Ga.
Hay, Isaac M., Melbourne
Hospital .....Melbourne
Hughlett, William S., M. E. C. M.,
Lusambo, Congo Belge.....Afrique
Page, Walter C.,
317 Delannoy Ave. .....Cocoa
Thomas, A. F., 2400 Massachusetts
Ave. .....Cambridge, Mass.
White, Charles B. .....Cocoa
Wood, George W. .....Rockledge

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..... Pompano
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.....Ft. Lauderdale
Brown, Oliver C., 411 1st National
Bank Bldg. .....Ft. Lauderdale
Butler, Bruce F.,
206 Bank Bldg. .....Hollywood
Carter, Donald E., 915 1st National
Bank Bldg. .....Ft. Lauderdale
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310 S. E. 7th St. ....Ft. Lauderdale
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Central Arcade .....Hollywood
Hendricks, Elliott M., 311 1st Nat'l
Bank Bldg. .....Ft. Lauderdale
Johnston, John A.,
Oliver Bldg. .....Ft. Lauderdale
Kinsey, E. T.,
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Klussman, Richard M.,
144 S. George St. .....York, Pa.
Lowry, Robert S.,
544 S. E. 6th Ave....Ft. Lauderdale
McLaury, Elbert, 214-220 1st
National Bank Bldg.....Hollywood
Penvy, Henry J., 505 1st National
Bank Bldg. .....Ft. Lauderdale
Roper, Luther E.,
2011 Hollywood Bldg.....Hollywood
Skiff, Francis S., 303 1st National
Bank Bldg. .....Ft. Lauderdale
Stanford, John A., 205 1st Nat'l
Bank Bldg. .....Ft. Lauderdale
Stovall, R. H., 1st National
Bank Bldg. .....Ft. Lauderdale
Walker, Harrison A., 214-220 1st
National Bank Bldg.....Hollywood
Winsor, Sanford A.,
City Pharmacy .....Pompano

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Arnold, L. J. .....Lake City
Bates, Thomas H.,
Blanche Hotel Annex....Lake City
Dyer, James H.,
U. S. Veterans' Hosp.....Lake City
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1091 Huntington Bldg.....Miami
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608 Huntington Bldg.....Miami
Agos, Isadore H.,
410 Huntington Bldg.....Miami
Allen, Omer F.,
711 Huntington Bldg.....Miami
Aronovitz, Samuel,
601 Professional Bldg.....Miami
Babcock, Donald T.,
Calumet Bldg. .....Miami
Babcock, Henry C.,
414 Calumet Bldg. .....Miami
Baker, Juel M.,
312-14 Seybold Bldg.....Miami
Baker, L. A.,
570 W. Flagler St.....Miami
Barfield, J. O.,
312 N. W. Third Ave.....Miami
Barge, H. A.,
420-421 Calumet Bldg.....Miami
Barge, W. J.,
420-421 Calumet Bldg.....Miami
Benton, George H.,
1503 Pizarro St. .....Coral Gables
Bertram, Albert J.,
37 N. W. 1st St. .....Miami
Boughton, Herman,
441 Washington Ave...Miami Beach
Bullard, Clifford P.,
215 Seybold Bldg.....Miami
Burch, R. N.,
2827 N. Miami Ave.....Miami
Carter, A. C., Hahn Bldg.....Miami
Chambers, Silas E.,
403 Huntington Bldg.....Miami
Chandler, G. E.,
Huntington Bldg. .....Miami
Conger, George D.,
2164 N. W. 28th St.....Miami
Coplan, M. M.,
601 Huntington Bldg.....Miami
Couric, Edmonson S.,
P. O. Box 265, Lemon City...Miami
DeBoe, Michael P.,
1st National Bank Bldg.....Miami
Dobrin, Max,
Professional Bldg. .....Miami
Dodge, Percy L.,
812 Huntington Bldg.....Miami
DuPuis, J. G., Lemon City.....Miami
Eckman, Benjamin F.....Homestead
Elder, Samuel F.,
Huntington Bldg. .....Miami
Elgin, Lee W.,
508 Huntington Bldg. .....Miami
Ellis, William H.,
315 Olympia Bldg. .....Miami
Flipse, Matthew J.,
306 Huntington Bldg.....Miami
Fox, H. H., Box 601 .....Miami
Foxworthy, F. W.,
911 Huntington Bldg. .....Miami
Freeman, Mary .....Perrine
French, Elmo D.,
603 Huntington Bldg. .....Miami
Ghertler, Max,
1715 S. W. 11th St. .....Miami
Goodson, W. M.,
315 Olympia Bldg.....Miami
Gowdy, Francis A.,
120-21 Shoreland Arcade.....Miami
Gowdy, Ralph A.,
925 Lincoln Road.....Miami Beach
Graves, J. Raymond,
309 Huntington Bldg.....Miami
Grimes, Dewey H., Box 377, South Miami
Haggard, William A.,
502 Security Bldg.....Miami
Hall, E. J., 201 Venetian Bldg...Miami
Hall, John E., Box 2722.....Miami
Hall, Thomas B.,
Aladdin Bldg. .....Miami Beach
Harris, David W.,
403 Huntington Bldg. .....Miami
Hart, Oliver J.,
301 East 20th St...New York, N. Y.
Hassell, C. S.,
Huntington Bldg. .....Miami
Heck, Maurice E.,
601 Professional Bldg.....Miami
Hatch, Ernest B.,
71 N. E. 11th St.....Miami
Hodsdon, Benjamin F.,
418-20 Security Bldg.....Miami
Hodsdon, L. A.,
418-20 Security Bldg.....Miami
Holmes, Albert G. H.,
420 N. E. First Ave.....Miami
Hotchkiss, W. T.,
Aladdin Bldg. .....Miami Beach
Hutson, Thomas W.,
309 Huntington Bldg.....Miami
Ingersoll, J. M.,
1700 S. Bayshore Lane.....Miami
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404 N. E. 27th St. .....Miami
Jeffrey, S. L.,
4022 Douglas Road.....Miami
Jenkins, Leslie M.,
712 Huntington Bldg.....Miami
Jenkins, Paul K.,
604 Fifth St. .....Miami Beach
Jones, Walter C., Jr.,
409 Calumet Bldg.....Miami
Jordan, W. B. .....Homestead
Keeler, Frank L.,
P. O. Box 1250 .....Miami
Keely, J., 161 N. E. 2nd St.....Miami
Kemp, Austin J.,
207-10 Congress Bldg.....Miami
Kennon, Charles L.,
411-12 Huntington Bldg.....Miami
Kirsch, Maxwell D.,
408 Huntington Bldg.....Miami
Lanier, W. T.,
19 S. W. 7th Ave.....Miami

Leavitt, H. A.,
127 N. E. 5th St. .....Miami
Lefholz, R.,
911 Huntington Bldg.....Miami
Lewis, Taylor,
302-4 Congress Bldg.....Miami
Light, S. D. W., Calumet Bldg...Miami
Lithgow, William D.,
245 N. E. 25th St.....Miami
Litterer, A. Buist,
603 Huntington Bldg.....Miami
Lott, Young C.,
144 N. E. 2nd Ave. .....Miami
Lucinian, Joseph H.,
403 Huntington Bldg.....Miami
Luke, J. M. J., Congress Bldg....Miami
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144 N. E. 2nd Ave.....Miami
Lyell, Robert O.,
305-10 Huntington Bldg.....Miami
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care Division of Health.....Miami
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1885 W. Flagler St. .....Miami
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Rosetta Theatre Bldg.....Miami
McKenzie, Olin G.,
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McKibben, William W.,
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Manson, Plumer J.,
Rosetta Theatre Bldg.....Miami
Marsh, Lucille Johnson,
704 Professional Bldg.....Miami
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548 W. Flagler St.....Miami
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502 Security Bldg.....Miami
Milton, J. D.,
905 Huntington Bldg.....Miami
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Moss, William H.,
44 N. E. 1st Ave. .....Miami
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306 Huntington Bldg.....Miami
Palmer, B. H.,
502 Huntington Bldg.....Miami
Panettiere, Cayetano,
Aladdin Bldg. .....Miami Beach
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202 Venetian Bldg.....Miami
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161 N. E. 2nd St.....Miami
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Allison Hospital.....Miami Beach
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610 Huntington Bldg. .....Miami
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Pearson, Nelson T.,
1st National Bank Bldg.....Miami
Pearson, Rufus J.,
306 Calumet Bldg.....Miami
Peters, Edgar,
506 Olympia Bldg.....Miami
Phillips, Kenneth,
120-21 Shoreland Arcade.....Miami
Quillian, Warren,
Coral Gables Clinic....Coral Gables
Raap, Gerard,
809 Huntington Bldg.....Miami
Repass, Robert E., cor. Lincoln Rd.
and Washington Ave...Miami Beach
Roche, Charles F.,
Aladdin Bldg. .....Miami Beach
Ryan, William B., Jr.,
Huntington Bldg.....Miami
Sayles, Charles F.,
311 N. W. 3rd St.....Miami
Schubert, Frank P.,
Allison Hospital.....Miami Beach
Shaw, E. Clay,
508 Huntington Bldg.....Miami
Shisler, J. W.,
205 Shoreland Arcade .....Miami
Simmons, John A. .....Arcadia
Simpson, J. R.,
1st Nat'l Bank Bldg., Ft. Lauderdale
Sinclair, J. A. B.,
1603 N. E. Second Ave.....Miami
Skaggs, P. T., Box 615.....Miami
Smith, C. Kirby,
210 E. Flagler St.....Miami
Smith, J. F.,
1110 Lincoln Road ....Miami Beach
Smith, J. W.,
1760 N. W. 5th St.....Miami
Smith, M.
405-6 Huntington Bldg.....Miami
Snyder, John W.,
402 Huntington Bldg.....Miami
Stewart, J. S.,
1051 Seybold Bldg. .....Miami
Stuart, J. D.,
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Tallman, Maurice H.,
312 Venetian Arcade.....Miami
Thomas, Edwin C.,
45 N. E. 5th St. .....Miami
Thomas, Kelly C.,
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Threlkeld, Major E.,
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Tumlin, Corbett E.,
315 Olympia Bldg. .....Miami
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Vogt, Ferdinand A.,
207 Calumet Bldg. .....Miami
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Watters, W. H., Boston-Miami Clinic,
P. O. Drawer H.....Coconut Grove
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Welch, P. B.,
227 Aragon Ave. .....Coral Gables
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Whitten, Benjamin L., Box 505, Miami
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Withers, G. H.,
Aladdin Bldg. .....Miami Beach
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Woodard, Robert C.,
203 Venetian Arcade.....Miami
Youmans, Corren P.,
701 Professional Bldg.....Miami
Youmans, I. C.,
Professional Bldg. .....Miami

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Weems, Howard V.,
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Shaw, W. McL., Treasurer, St.
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Adams, Thomas S.,
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St. James Bldg. .....Jacksonville
Arms, B. L. .....Idaho Falls, Idaho
Bacon, Henry,
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Baker, R. M.,
Professional Bldg. .....Jacksonville
Baker, W. J. .....Foley
Barfield, Frederick G.,
St. James Bldg. .....Jacksonville
Baumgartner, Carl J.,
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Bayless, W. C.,
202 St. James Bldg.....Jacksonville
Beals, John A.,
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Med. Arts Bldg., Chattanooga, Tenn.
Beckman, George E.,
Professional Bldg.....Jacksonville
Black, J. B.,
St. James Bldg.....Jacksonville
Blackmar, Ray W., 320-321 St.
James Bldg. .....Jacksonville
Blinn, T. A.,
St. James Bldg.....Jacksonville
Boone, James L., 500 Professional
Bldg. .....Jacksonville
Bowen, Frederick J.,
St. James Bldg.....Jacksonville
Boyd, John E., 342 St. James
Bldg. .....Jacksonville
Bransford, L. E.,
Professional Bldg.....Jacksonville
Brewster, Warren A. .....Callahan
Brillhart, H. L.,
Graham Bldg. .....Jacksonville
Brink, F. A., 502 King St., Jacksonville
Brinson, P. A. .....Baldwin
Brinson, W. D. .....Baldwin
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Bryant, James M.,
305 Wade Bldg. .....Jacksonville
Buckman, Thomas E.,
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Carefoot, E. I.,
Professional Bldg.....Jacksonville
Carradine, J. H. .....Orange Park
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2033 Riverside Ave.....Jacksonville
Chapman, Benjamin A.,
348 St. James Bldg.....Jacksonville
Chilli, Joseph L.,
318 St. James Bldg.....Jacksonville
Collins, C. C.,
St. James Bldg.....Jacksonville
Copeland, Silas M.,
203 St. James Bldg.....Jacksonville
Copp, F. A.,
458 St. James Bldg.....Jacksonville
Counts, H. W., Peninsular
Casualty Bldg.....Jacksonville
Croft, Theodore G.,
St. James Bldg.....Jacksonville
Cunningham, Lester W.,
St. James Bldg.....Jacksonville
Day, Gaston,
St. James Bldg.....Jacksonville
Dean, Russell,
St. James Bldg. .....Jacksonville
Drew, Horace R.,
St. James Bldg. .....Jacksonville
Driskell, Simon E.,
St. James Bldg. .....Jacksonville
Enneis, F. B.,
Professional Bldg. .....Jacksonville
Erwin, Stanley,
1001 Lynch Bldg.....Jacksonville
Faver, Robert M. .....Lake Geneva
Field, Thomas S.,
712 Laura St.....Jacksonville
Fisher, L. C.....Green Cove Springs
Fort, Frank L.,
Professional Bldg.....Jacksonville
Furnish, Richard D.,
452 St. James Bldg....Jacksonville
Gammon, Julian E.,
700 Professional Bldg., Jacksonville
Goethe, James E.,
209 St. James Bldg.....Jacksonville
Goodale, Banks H.,
St. James Bldg. .....Jacksonville
Gorman, John M.,
424 St. James Bldg.....Jacksonville
Greene, Ralph N., Wade Bldg.,
1022 Park St. .....Jacksonville
Gwinn, Van H.,
2585 Riverside Ave.....Jacksonville
Harrell, D. E.,
St. James Bldg.....Jacksonville
Harris, Herrman H., 608 Greenleaf
& Crosby Bldg.....Jacksonville
Harris, W. G.,
St. James Bldg. .....Jacksonville
Hartman, James H.,
546 Lomax St. .....Jacksonville
Harwell, D. F., Peninsular Cas-
ualty Bldg. .....Jacksonville
Heggie, N. M.,
33-36 Buckman Bldg...Jacksonville
Henson, Graham E.,
201-2 St. James Bldg...Jacksonville
Herlong, M. B.,
211 St. James Bldg.....Jacksonville
Hodges, John W., U. S. Veterans'
Bureau, 111 N. Canal St.
.....Chicago, Ill.
Holden, Gerry R., Wade Bldg.,
1022 Park St.....Jacksonville
Horne, Hendley F.,
St. James Bldg. .....Jacksonville
Humphreys, David G.....Fernandina

Ira, Gordon H.,
452 St. James Bldg.....Jacksonville
Ives, Harold A.,
711 Roselle St.....Jacksonville
Jennings, C. L.,
Wade Bldg. .....Jacksonville
Johnston, Crowell W.,
404 St. James Bldg.....Jacksonville
Jones, F. C., Graham Bldg., Jacksonville
Keisling, Frederick C.,
315 Professional Bldg., Jacksonville
Key, Foster P. .....Green Cove Springs
Killinger, Raymond R.,
St. James Bldg.....Jacksonville
Kirby-Smith, Joseph L., 511-15
Greenleaf & Crosby Bldg.
..... Jacksonville
Kirk, William W., 608 Greenleaf
& Crosby Bldg.....Jacksonville
Knauer, W. J.,
Buckman Bldg.....Jacksonville
Knight, A. Comer,
Professional Bldg.....Jacksonville
Krueger, Frederick W.,
452 St. James Bldg....Jacksonville
Limbaugh, Louie M.,
458 St. James Bldg.....Jacksonville
Love, J. D., 2063 Oak St....Jacksonville
McEuen, Harry B., 320 Profes-
sional Bldg. .....Jacksonville
McGinnis, Robert H.,
2063 Oak St. .....Jacksonville
McIver, Robert B.,
St. James Bldg. .....Jacksonville
McKenzie, Albert C.,
326 St. James Bldg.....Jacksonville
Mabry, C. B.,
St. James Bldg. .....Jacksonville
Manhoff, Ben,
712 Laura St.....Jacksonville
Manning, William S.,
St. James Bldg. .....Jacksonville
Martin, P. H.,
Professional Bldg.....Jacksonville
May, Robert D.,
305 Professional Bldg...Jacksonville
Milam, Ernest B., Wade Bldg.,
1022 Park St. .....Jacksonville
Mitchell, George M.,
712 Laura St. .....Jacksonville
Mitchell, John H.,
300 Professional Bldg, Jacksonville
Moe, Leonard N.,
212 St. James Bldg.....Jacksonville
Morgan, Thomas E.,
St. James Bldg.....Jacksonville
Morris, S. A.,
237 W. Duval St.....Jacksonville
Norris, Samuel R., Wade Bldg.,
1022 Park St. .....Jacksonville
Norwood, J. K.,
211 St. James Bldg.....Jacksonville
Oetjen, G. F.,
St. James Bldg.....Jacksonville
Owens, J. H.,
452 St. James Bldg.....Jacksonville
Parramore, James B.,
401 St. James Bldg.....Jacksonville
Pasco, J. D., Wade Bldg.,
1022 Park St.....Jacksonville
Peterson, C. A.,
St. James Bldg.....Jacksonville
Peyton, Harry A.,
2033 Riverside Ave.....Jacksonville
Porter, H. W.,
348 St. James Bldg.....Jacksonville
Proctor, Harper L.,
210 Professional Bldg., Jacksonville
Ramage, Raymond B., 219-20
Professional Bldg.....Jacksonville
Randolph, J. H.,
St. James Bldg.....Jacksonville
Reaves, H. A.,
Professional Bldg.....Jacksonville
Richards, Ferdinand,
Professional Bldg.....Jacksonville
Richardson, George W.,
343 St. James Bldg.....Jacksonville
Richardson, Shaler,
111 W. Adams St.....Jacksonville
Rogers, W. W.,
Professional Bldg.....Jacksonville
Rollins, Clarence D.,
2162 Riverside Ave.....Jacksonville
Ross, W. E.,
St. James Bldg.....Jacksonville
Sanderson, Raymond, 216 Pro-
fessional Bldg. .....Jacksonville
Sandusky, C. M.,
28 W. Monroe St.....Jacksonville
Schnauss, William R., 312 Hilde-
brandt Bldg. .....Jacksonville
Schneider, David, Greenleaf &
Crosby Bldg. .....Jacksonville
Sellers, E. T., 412-413 St. James
Bldg. .....Jacksonville
Sengstak, Ernst P. E.....Mandarin
Simpson, James K.,
712 Laura St.....Jacksonville
Skipper, C. T.,
St. James Bldg.....Jacksonville
Smith, Ralph E.,
211 E. Forsyth St.....Jacksonville
Stollenwerck, A. D.,
25 W. Beaver St.....Jacksonville
Swift, Edwin C.,
2033 Riverside Ave.....Jacksonville
Taylor, H. Marshall,
111 W. Adams St.....Jacksonville
Teeter, Edmund H.,
305 St. James Bldg....Jacksonville
Thomas, Robert Y. H.,
502-4-6 Lynch Bldg.....Jacksonville
Thompson, David C.,
2579 Herschell St.....Jacksonville
Thompson, T. C.,
318 Hildebrandt Bldg...Jacksonville
Tyler, Lockland V.,
San Marco Square..So. Jacksonville
Upchurch, Noble A.,
City Board of Health..Jacksonville
Van Schaick, Harold D.,
210 St. James Bldg.....Jacksonville
Veal, Ernest W.,
128 St. Johns Ave., So. Jacksonville
Waas, F. J.,
Professional Bldg.....Jacksonville
Washburn, Clayton D.,
St. James Bldg.....Jacksonville
Wilcox, Clarence R.,
712 Laura St. .....Jacksonville
Wilkinson, Albert H.,
313 Professional Bldg., Jacksonville
Wilson, Alpheus K.,
334 St. James Bldg.....Jacksonville
Wilson, J\ F., 310-12 Greenleaf &
Crosby Bldg.....Jacksonville
Woolsey, Bertram F.,
320 St. James Bldg.....Jacksonville
Wynn, Robert S., 305 Consolidated
Bldg. .....Jacksonville

ESCAMBIA COUNTY MEDICAL SOCIETY

Lischkoff, Mozart A., President,
Blount Bldg. .....Pensacola
Thames, Rufus, Vice-Pres.....Milton
Bell, John D., Sec.-Treas., 305
Blount Bldg. .....Pensacola
Ames, Allen M.,
206 Blount Bldg.....Pensacola
Anderson, Warren E., 511 American
Nat'l Bank Bldg.....Pensacola
Bickerstaff, James H.,
Blount Bldg.....Pensacola
Bryans, H. L.,
21½ E. Wright St.....Pensacola
Bryans, R. L.,
23 E. Wright St.....Pensacola
D'Alemberte, Clinton W., 302 Amer-
ican Nat'l Bank Bldg.....Pensacola
Dewberry, W. C.,
Theisen Bldg. .....Pensacola
Dodson, M. W. .....Munson
Fellows, J. H., Brent Bldg....Pensacola
Gachet, Necy L. .....Century
Haisfield, Abram R.,
311 Blount Bldg.....Pensacola
Heinberg, Charles J.....Pensacola
Hixon, F. P. .....Pensacola
Hoffman, James M.,
Pensacola Hospital.....Pensacola
Holley, John C. .....Milton
Mixon, J. A., Box 697.....Pensacola
Nobles, R. G., Blount Bldg...Pensacola
Nobles, V. R., Blount Bldg...Pensacola
Nobles, W. D. .....Pensacola
Payne, W. C., Blount Bldg...Pensacola
Peel, George T., Brent Bldg., Pensacola
Pierpont, Juriah H., 511 American
Nat'l Bank Bldg.....Pensacola
Pollock, William A. J., Jr.,
303 Theisen Bldg.....Pensacola
Quina, M. E. .....Pensacola
Renshaw, F. G.,
104 S. Palafox St. .....Pensacola
Simpson, Horace L.,
303 Theisen Bldg. .....Pensacola
Stokes, Thomas H.,
Theisen Bldg. .....Pensacola
Sullivay, Rosa L.,
1016 W. Chase St.....Pensacola
Turberville, John S. .....Century
Turner, John B. .....Bagdad
Webb, Carol C.,
303 Blount Bldg. .....Pensacola

HAMILTON COUNTY MEDICAL SOCIETY

Barnett, R. A., Sec'y.....White Springs
Bruce, John R. .....Jasper
Corbett, J. H. .....Jasper

HILLSBORO COUNTY MEDICAL SOCIETY

Marney, Charles R., President
242 Lafayette Arcade.....Tampa
Bidwell, Alfred M., Vice-Pres., 401
First Nat'l Bank Bldg.....Tampa
Barker, Frank T., Sec.-Treas.,
302 Krause Bldg.....Tampa
Adamson, William P.,
610 Citizens Bank Bldg.....Tampa
Allen, Bundy,
302 Citizens Bank Bldg.....Tampa
Alsobrook, John W.,
120 N. Collins St.....Plant City
Andrews, Chadbourne A.,
715 Citizens Bank Bldg.....Tampa
Baldwin, R. E.,
817 Citizens Bank Bldg.....Tampa
Bartlett, Charles W., Jr.,
1521 7th Ave. .....Tampa
Beyer, A. R., Box 474.....Tampa
Bitzer, Emory W.,
815 Citizens Bank Bldg.....Tampa
Black, Robert C.,
101 San Ever St.....Plant City
Blackman, H. J.,
Citizens Bank Bldg.....Tampa
Blake, W. C.,
412 Citizens Bank Bldg.....Tampa
Boling, John R.,
1207 First Nat'l Bank Bldg....Tampa
Bottari, Giulio C.,
1829½ Seventh Ave.....Tampa
Butchart, T. R.,
112 N. Boulevard .....Tampa
Byrd, Hiram,
35 W. Bethune.....Detroit, Mich.
Carlton, Leland F.,
805 Citizens Bank Bldg.....Tampa
Carter, E. F.,
1903 Grand Central Ave.....Tampa
Chandler, J. C.,
Citrus Exchange Bldg.....Tampa
Christian, George R.,
305 Citizens Bank Bldg.....Tampa
Cook, George L.,
906 South Rome Ave.....Tampa
Cook, H. M.,
309 E. Ross Ave.....Tampa
Costa, Frank J.,
1801½ 22nd St. .....Tampa
Cowart, James T.,
906 South Rome Ave.....Tampa
Crum, James W.,
412 Schulte United Bldg.....Tampa
Daniels, Benjamin A.,
608 Tampa St. .....Tampa
Davis, John McM.,
1207 First Nat'l Bank Bldg..Tampa
Deedera, Carleton,
102 Habana St. .....Tampa
Dickinson, Joshua C.,
302 Citizens Bank Bldg.....Tampa
Draper, Arthur D.,
5607 Florida Ave. .....Tampa
Duke, Roncie R.,
708 Citizens Bank Bldg.....Tampa
Duncan, William P.,
401 Tampa Theatre Bldg.....Tampa
Dyer, Walter H.,
1801½ 22nd St.....Tampa
Edwards, W. E.,
Oak Park Station.....Tampa
Efird, Lester J.,
509 Stovall Bldg.....Tampa
Ely, R. A., 404½ Zack St.....Tampa
Estes, J. L.,
815 First Nat'l Bank Bldg...Tampa
Etheredge, S. H.,
317 Citizens Bank Bldg.....Tampa
Farrior, Joseph B.,
605 Citizens Bank Bldg.....Tampa
Faver, Henry M.,
402 Citrus Exchange Bldg...Tampa
Fluker, Carl B., 608 Tampa St., Tampa
Forbes, Sherman B.,
409 Citizens Bank Bldg.....Tampa
Foster, John C., 216 Cass St.....Tampa
Gale, John S.,
5402 Central Ave.....Tampa
Gilbert, Elsie,
6508 Central Ave.....Tampa
Gilmer, Eugene S.,
612 Citizens Bank Bldg.....Tampa
Glass, Roscoe E., 914 14th Ave., Tampa
Grantham, James M.,
242 Lafayette Arcade.....Tampa

Gyland, Stephen P.....Brewster
Hamner, George P.....Penney Farms
Hampton, H. S.,
P. O. Box 2113.....Tampa
Hardy, G. E. W.,
818 First Nat'l Bank Bldg., Tampa
Helms, J. S.,
Citizens Bank Bldg.....Tampa
Henderson, R. P.,
613 Citizens Bank Bldg.....Tampa
Higgins, Allen F.,
230 Lafayette Arcade.....Tampa
Hopkins, Clack D.,
810 S. Freemont Ave.....Tampa
Hubbard, Roscoe C.,
2220 7th Ave. .....Tampa
°Ives, A. C., Hinson Bldg.....Tampa
Jefferson, Rollin,
818 First Nat'l Bank Bldg...Tampa
Jenson, Henry J.,
7303 Nebraska Ave.....Tampa
Jobson, A. M. C.,
910 First Nat'l Bank Bldg...Tampa
Knauf, A. R.,
810 Citizens Bank Bldg.....Tampa
Knight, J. C. .....Plant City
Lake, Esley T., Box 8968.....Tampa
Lancaster, William J., Box 2856, Tampa
Lassman, George,
516½ Franklin St.....Tampa
Lowry, Blackburn W.,
408 Citrus Exchange Bldg...Tampa
McEachern, J. R., Box 1181.....Tampa
McMurray, Henry E.,
211 Cardy Street.....Tampa
McRae, E. H.,
402 Citrus Exchange Bldg...Tampa
Maguire, Thomas C.,
104 S. Collins St.....Plant City
Maner, George R.,
5202 Central Ave. .....Tampa
Martin, Douglas D.,
906 S. Rome Ave. .....Tampa
Meighen, Douglas G.,
325 Lafayette Arcade.....Tampa
Mills, David A.,
812 S. Rome Ave.....Tampa
Mills, John H.,
910 E. Michigan Ave.....Tampa
Mitchell, L. B., Box 737.....Tampa
Myers, Wade C.,
302 Schulte United Bldg....Tampa
Nelson, Robert G.,
712 Citizens Bank Bldg.....Tampa
Oppenheimer, Louis S.,
408 Citizens Bank Bldg.....Tampa
Ortega, Rafael, 1805 15th St....Tampa
Pate, Julien C.,
1107 First Nat'l Bank Bldg., Tampa
Patterson, William,
Citrus Exchange Bldg.....Tampa
Pearson, R. J.,
Route 1, Box 186.....Tampa
Rankin, Grover C., Box 2233....Tampa
Rowlett, W. M., Box 603.....Tampa
Saxton, J. J., 205 Zack St.....Tampa
Shaver, E. F., 1801½ 22nd St....Tampa
Smith, Burdette,
411 Citrus Exchange Bldg., Tampa
Smith, H. Mason,
903 Tampa Theatre Bldg....Tampa
Smith, Walton H. Y.,
City Health Dept.....Tampa
Smoak, Edward,
315 Citizens Bank Bldg.....Tampa
Snow, H. O.,
1903 Grand Central Ave.....Tampa
Spengler, Nathaniel L.,
903 Tampa Theatre Bldg.....Tampa
Stone, Alvord L.,
603 Citizens Bank Bldg.....Tampa
Stringer, Sheldon,
P. O. Box 162.....Tampa
Taylor, Joseph W.,
Room 807, 706 Franklin St., Tampa
Thorpe, Franklin, 500 Beaux Arts
Bldg. .....Los Angeles, Calif.
Torbett, R. S.,
619 Citizens Bank Bldg.....Tampa
Truelsen, Thomas,
Room 605, 706 Franklin St., Tampa
Vaughan, Cecil,
908 First Nat'l Bank Bldg., Tampa
Weekley, Augustine S.,
325 Lafayette Arcade.....Tampa

JACKSON COUNTY MEDICAL SOCIETY

Harrison, C. H., Sec.-Treas...Cottondale
Baltzell, N. A. .....Marianna
Box, Wilmer C. .....Graceville
Burns, M. Q. .....Blountstown
Dowling, J. E. ..... Alliance
Finley, D. H. .....Blountstown
Hodges, G. S. .....Marianna
Hudgens, Thomas H. .....Sneads
McKinnon, Daniel A. .....Marianna
McLeod, John E.,
R.R. Station No. 2.....Cypress
Marshburn, Eustis R.,
Coca-Cola Bldg. .....Marianna
Miller, Redden L., Box 186....Graceville
Price, C. J. .....Alford
Ryals, C. H., R. F. D No. 1, Grand Ridge

LAKE COUNTY MEDICAL SOCIETY

Colley, Sanford C., President...Tavares
°Calvin, William J., Vice-Pres.,
Box 966 .....Eustis
Ashton, Wilbur L., Sec.-Treas., Umatilla
Coupland, James D. .....Eustis
DeVane, W. G. .....Groveland
Fenn, Harry T. .....Mount Dora
Hannum, M. M. .....Eustis
Holland, Howard G.,
202 State Bank Bldg.....Leesburg
Izlar, A. L. .....Clermont
Lodor, Charles H.,
Palm Pharmacy Bldg.....Eustis
Lott, Walter M., 953 McClurkan
Ave. .....Nashville, Tenn.
Toy, Samuel H. .....Umatilla
Tyre, C. McK.....Eustis
Williams, Rabun H.,
Theatre Bldg. .....Eustis

LEE COUNTY MEDICAL SOCIETY

Longbrake, Guy A., President,
308 2nd St. .....Ft. Myers
Jones, H. Quillian, Sec.-Treas.,
18-20 Leon Bldg.....Ft. Myers
Bostleman, Ernest,
201 Pythian Bldg.....Ft. Myers
Grace, William H.,
15 Earnhardt Bldg.....Ft. Myers
Harrison, Warren A.,
Pythian Bldg. .....Ft. Myers
Hunter, A. P.,
Langford Bldg. .....Ft. Myers
Merrick, Charles G.,
Leon Sims Bldg. .....Ft. Myers
Newton, Robley D. .....Ft. Myers
Seebold, J. L. .....LaBelle

LEON-GADSDEN-LIBERTY-WAKULLA-JEFFERSON COUNTY MEDICAL SOCIETY

Davis, Julius C., Jr., President,
203-8 Masonic Temple.....Quincy
Moor, F. Clifton, Sec.-Treas.,
Telephone Bldg. .....Tallahassee
Barnes, Benjamin F.....River Junction
Bertrem, J. Willie.....Havana
Brinson, John B., Jr.,
Dogwood St. .....Monticello
Daves, F. E. .....Chattahoochee
Dozier, L. L. .....Tallahassee
Folmar, James Q. .....Chattahoochee
Gainey, J. G. .....Quincy
Gardner, O. W. .....Greensboro
Glover, George B. .....Monticello
Godard, Robert F., Key Bldg....Quincy
Inman, Joseph C., Jr., Florida
State Hospital .....Chattahoochee
Johnston, John K.,
Exchange Bank Bldg...Tallahassee
Kendrick, Odis, G. .....Tallahassee
Miles, W. G. .....Chattahoochee
Palmer, Henry E.,
408 South Adams St....Tallahassee
Pound, J. H. .....Chattahoochee
Rhodes, Bricey M.,
121 E. College Ave.....Tallahassee
Sapp, H. H. .....Havana
Walker, William H. .....Lamont
Weems, George E. .....Apalachicola
Wilhoit, Sterling E. .....Quincy
Wilkinson, B. A.,
Telephone Bldg. .....Tallahassee
Williams, J. F. .....Monticello

MADISON COUNTY MEDICAL SOCIETY

Yates, D. H., President.....Madison
Kinsey, Junius P., Vice-Pres....Pinetta
Davis, George O., Sec.-Treas...Madison
Blalock, Alonzo L. .....Madison
Hamrick, B. F. .....Madison
Long, E. .....Madison
McLeod, R. F., P. O. Box 637..Madison

MANATEE COUNTY MEDICAL SOCIETY

Blake, Lowrie W., President..Bradenton
Harrison, M. M., Vice-Pres...Bradenton
Davis, John McM., Sec.-Treas.,
1207 First Natl. Bank Bldg..Tampa
Brown, J. O. .....Palmetto
Bryan, Clarence H.,
Dixie Grande Hotel.....Bradenton
Clark, T. C. .....Bradenton
English, A. Q. .....Palmetto
Field, Charles H. .....Marietta, Ga.
Fleming, Claude F. .....Elkhart, Ind.
Gates, Hubbard,
P. O. Box 245.....Bradenton
Hollingsworth, Samuel G.,
451 12th St. .....Bradenton
Lancaster, B. M. .....Manatee
Larrabee, Charles W.,
Larrabee Hospital.....Bradenton
Leffingwell, John B.,
First Natl. Bank Bldg...Bradenton
McCoy, Thomas S., Singletary-
Cummings Bldg. .....Bradenton
McDuffie, Toliver M. .....Manatee
Mason, John F. .....Bradenton

MARION COUNTY MEDICAL SOCIETY

Stutts, Baldwin S., President,
Anderson Bldg. .....Dunnellon
Ferguson, R. D., Vice-Pres.,
Box 802 .....Ocala
Wallis, Thomas H., Sec.-Treas.,
104 S. Magnolia St.....Ocala
Baskin, J. G. .....Dunnellon
Chalker, James L.,
108 S. Magnolia St.....Ocala
Curry, J. F. .....Dunnellon
Dozier, Henry C.,
9 North Magnolia St.....Ocala
Freeman, Albert H.,
Holder Block .....Ocala
Laffitte, L. Sydnor .....Gulf Hammock
Lane, W. K. .....Ocala
Lindner, E. G. .....Ocala
Lisk, Percy F. .....Ft. McCoy
Martin, I. E. .....Ocklawaha
Moore, J. N.,
210-12 Professional Bldg.....Ocala
Peek, Eugene G.,
104 S. Magnolia St.....Ocala
Slaughter, T. K. .....Oxford
Strange, J. L. .....McIntosh
Strickland, Edgar E. .....Citra
Turner, Smith L. .....Williston
Van Engelken, Louis H. .....Ocala
Watt, Harry F.,
Holder Block .....Ocala

MONROE COUNTY MEDICAL SOCIETY

Keating, William B., President,
627 Eaton St. .....Key West
Pintado, Nilo C., Vice-Pres.,
330 Duval St. .....Key West
Warren, William R., Sec.-Treas.,
511 Eaton St. .....Key West
Galey, Harry C.,
532 Fleming St. .....Key West
Lowe, Eugene C.,
713 Eaton St. .....Key West
Plummer, George,
504 Simonton St. .....Key West
Porter, Joseph Y., Jr.,
417 Eaton St. .....Key West

ORANGE COUNTY MEDICAL SOCIETY

Chiles, J. H., President.....Orlando
Spiers, William H., Vice-Pres.,
209 Clinic Bldg. .....Orlando
Chappell, John R., Secretary,
Box 1370 .....Orlando
Collins, Charles J., Treasurer,
209-212 Exchange Bldg.....Orlando
Andrews, Laurin L.,
Florida Sanitarium.....Orlando
Andrews, Mitchell M.,
Box 1817.....Orlando
Ashley, K. C.,
Florida Sanitarium.....Orlando
Beardall, Harold M.,
147 E. Church St. .....Orlando
Brinson, H. .....Kissimmee
Burks, B. Auxford,
108 E. Park Ave.....Winter Park
Butler, Paul T.,
314 State Bank Bldg.....Orlando
Carroll, C. .....Apopka
Christ, Calvin D.,
11 Lucerne Circle.....Orlando
Coffin, C. E., 336 Interlachen
Ave. .....Winter Park
Craney, Edward T.,
Orlando Clinic .....Orlando
Day, Horace A.,
209-212 Exchange Bldg.....Orlando

Dodds, William H.,
11th St. & Penn. Ave....St. Cloud
Edwards, Gaston H.,
Clinic Bldg. .....Orlando
*English, David E.,
23 E. Livingston Ave.....Orlando
Folsom, Spencer A.,
11 Lucerne Circle.....Orlando
Gardner, J. F.....Winter Park
Geiger, Hugh S.,
24½ Broadway .....Kissimmee
Gray, Frank D.,
11 Lucerne Circle.....Orlando
Gwynn, Humphrey W.,
Clinic Bldg. .....Orlando
Harms, F. H.,
40 N. Orange St.....Orlando
Hoffman, Carl D.,
25-27 Autrey Arcade.....Orlando
Hotard, Roland F.,
226 E. Park Ave.....Winter Park
Ingram, L. C. .....Orlando
Johnston, Colonel George,
217 E. Amelia.....Orlando
Johnston, Hewitt,
11 Lucerne Circle.....Orlando
Jones, Allan.....Holopaw
*Kime, R. R.....Orlando
Lawson, Ben H.....Winter Garden
Lewis, P. M.,
Rose Bldg. .....Orlando
McBride, Thomas E.....Apopka
McElroy, Sylvan,
248 S. Orange Ave.....Orlando
McEwan, John S.,
Clinic Bldg. .....Orlando
Mallory, Meredith,
Clinic Bldg. .....Orlando
Marshall, C. J.....Sanford
Neal, Thomas A.,
356 N. Orange Ave.....Orlando
Oertel, H. B.,
1415 E. Colonial Drive....Orlando
Orr, Louis McD., Jr.,
11 Lucerne Circle.....Orlando
Osincup, Gilbert S.,
300 E. Colonial Drive.....Orlando
Perkins, Herman .....Holopaw
Person, W. C., P. O. Box 571..Orlando
Pines, John A., Orlando Clinic..Orlando
Reading, John L.,
126 S. Orange St.....Orlando
Rivers, Thomas M.....Kissimmee
Shoemaker, Samuel A.,
30 East Church St.....Orlando
Sinclair, W. E.,
Clinic Bldg. .....Orlando
Summitt, R. E.....Shamrock
Westcott, William E.,
Florida Sanitarium.....Orlando
White, Roland T.,
211 S. Rosalind Ave.....Orlando

PALM BEACH COUNTY MEDICAL SOCIETY

Herpel, Frederick K., President,
Box 1057 .....West Palm Beach
Schiffli, O. F., Vice-Pres.,
.....West Palm Beach
Lewis, Gaylord, Secretary,
Guaranty Bldg. .. West Palm Beach
Netto, Lloyd J., Treasurer, 415 Comeau Bldg. .....West Palm Beach
Arnold, Wilbur O.,
Box 1735 .....West Palm Beach
Baldwin, R. Henry, 309 Harvey
Bldg. .....West Palm Beach
Bazemore, Mary K., Daniels & Fisher Stores .... Denver, Colorado
Binkley, John F., 1206 Harvey
Bldg. ..... West Palm Beach
Blair, William M., 424 Comeau
Bldg. .....West Palm Beach
Brantley, Grady H.,
811½ Lake Ave.....Lake Worth
Buck, W. J.....Belle Glade
Carlisle, J. L., 307 Harvey
Bldg. .....West Palm Beach
Clay, B. S., 1203 Harvey
Bldg. .....West Palm Beach
Cooley, Roy O.,
Box 1735.....West Palm Beach
Dawson, George M., P. O. Box
1836 .....West Palm Beach
Denison, Raymond C.,
117 North J St.....Lake Worth
Fleming, Samuel W., 417 Harvey
Bldg. .....West Palm Beach
Gardner, W. H.,
Guaranty Bldg. ..West Palm Beach
George, William W., 1116 Harvey
Bldg. .....West Palm Beach
Gerlach, Earl B., 326 Lakeview
Ave. .....West Palm Beach
Gill, Richard S.....Hopewell, Va.
Gunter, T. D.,
Box 85.....West Palm Beach
Heath, Guy W., 409-11 Harvey
Bldg. .....West Palm Beach
Herman, F. Peter, 1007 Harvey
Bldg. .....West Palm Beach
Jared, Vernon M.,
Box 1956 .....West Palm Beach
Newton, S. B.,
168 Sea Breeze Ave.....Palm Beach
Oughterson, William A.,
Rm. 506, 2054 E. 90..Cleveland, Ohio
Papot, Grace E., 310 Comeau
Bldg. .....West Palm Beach
Peek, Leon A., 119 S. Narcissus
St. .....West Palm Beach
Peery, E. W., 524 Comeau
Bldg. .....West Palm Beach
Pittman, J. H.....West Palm Beach
Powell, J. A.,
Box 561.....West Palm Beach
Rodrick, A. F.,
21 Baker St.....Beverly, Mass.
Rowe, A. L.,
Grady Hospital.....Atlanta, Ga.
Rozier, Lauchlin McK., 411-414 Comeau Bldg. .....West Palm Beach
Sayad, William Y., 1215 Harvey
Bldg. .....West Palm Beach
Shackelford, C. W...West Palm Beach
Shackelford, W. L...West Palm Beach
Sory, B. B., Jr.....Lake Worth
Spooner, D. S.....Pahokee
Stone, Vale D., 411 Comeau
Bldg. .....West Palm Beach
Van Landingham, William E.,
Box 758.....West Palm Beach
Webb, Roy .....Palm Beach
Weems, Nat. M.....Boynton
Wilbur, A. B.
Whitman, Frank S., 511-12 Comeau
Bldg. .....West Palm Beach

PASCO-HERNANDO-CITRUS COUNTY MEDICAL SOCIETY

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Box 241.....Dade City
Dame, George A., Vice-Pres.,
115 Main St.....Inverness
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112 N. Main St.....Brooksville
Bradshaw, J. T.....Lake Jovita
Cannon, Augustus B.....Lacoochee
Coogler, A. C.....Brooksville
Furlow, L. T.....Brooksville
Hancock, William S., Jr.,
.....New Port Richey
Hudson, P. J.....Crystal River
McLeod, Thomas.....Lacoochee
Miller, J. F.....Inverness
Moon, William B.....Crystal River
Sistrunk, Robert D.....Dade City

PINELLAS COUNTY MEDICAL SOCIETY

Wade, Hugh W., President, 512 Florida Power Bldg.....St. Petersburg
Winchester, Harold E., First
Vice-Pres. .....Dunedin
O'Brien, Raymond K., Second Vice-Pres., E. 105 5th Ave., N.,
.....St. Petersburg
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Post, William G., Jr., Treasurer,
814-815 Power & Light Bldg.,
.....St. Petersburg
Albaugh, Andrew P....Tarpon Springs
Anderson, Willam D.,
Box 53.....Largo
Bieker, Annette M.,
Power & Light Bldg. St. Petersburg
*Bieker, Siegfried B.,
Power & Light Bldg. St. Petersburg
Black, M. Eldridge,
311 Coachman Bldg....Clearwater
Brown, Harold O.,
Coachman Bldg.....Clearwater
Bucknell, Howard,
....Upper Saranac, N. Y.
Burnette, Elmer W., First Natl.
Bank Bldg.....Tarpon Springs
Coll, Hugh J.....Connellsville, Pa.
Cooper, J. H., First Natl.
Bank Bldg.....St. Petersburg
Cranford, J. F., 512-14 First Natl.
Bank Bldg.....St. Petersburg
Davies, Ray,
523 W. 6th St...Los Angeles, Calif.
Davis, W. M.,
342 1st Ave., N.....St. Petersburg
Dawson, S. A., 105-107 Medical
Arts Bldg.....St. Petersburg
Dickerson, Lucien B.,
Williamson Bldg. .....Clearwater
Echard, T. B.....Connellsville, Pa.
Fisk, Harley B., 914 West Coast
Title Bldg. .....St. Petersburg
Funk, Neil E., 401 1st Natl.
Bank Bldg. .....St. Petersburg
Gable, Linwood M., 803 First Natl.
Bank Bldg. .....St. Petersburg
Gable, N. Wilson, First Natl.
Bank Bldg. .....St. Petersburg
Gable, N. Worth, 807 First Natl.
Bank Bldg. .....St. Petersburg
Green, T. H.,
Power & Light Bldg..St. Petersburg
Griffin, Thomas R.,
Power & Light Bldg..St. Petersburg
Groves, W. H.....Clearwater
Harden, W. W.,
Smith Bldg. .....St. Petersburg
Hardenbergh, John A.,
Sta. A, Box 305.....St. Petersburg
Heibner, Eugene A.,
Power & Light Bldg..St. Petersburg
Herring, John A.,
Medical Arts Bldg...St. Petersburg
Hooper, C. A.....Charlotte, N. C.
Jennings, Frank S.....Dryden, N. Y.
Kaufman, Frank E.,
Coachman Bldg.....Clearwater
Knowlton, R. H.,
Power & Light Bldg..St. Petersburg
Lambdin, L.,
Box 1805 .....St. Petersburg
Leith, Richard B.,
201 Snell Bldg.....St. Petersburg
Lochner, G. M., First Natl.
Bank Bldg.....St. Petersburg
Lustig, Emil,
500 7th Ave., N.....St. Petersburg
McCallister, Archie,
Meres Bldg.....Tarpon Springs
McConnell, Whitman C., 104-113
Medical Arts Bldg...St. Petersburg
MacCordy, Earl C.,
202 Snell Bldg.....St. Petersburg
Marr, Norval M.,
Power & Light Bldg..St. Petersburg
Mease, John A.,
Virginia Ave.....Dunedin
Melville, Edmond J.,
335 Third Ave., N...St. Petersburg
Mighell, Norman E.....Clearwater
Miller, George E., 208-210 Medical
Arts Bldg.....St. Petersburg
Mills, A. L., 806 Power
& Light Bldg.....St. Petersburg
Moeller, Maximilian W.,
525 1st Ave., N.....St. Petersburg
Murphy, Ralph D.,
Box 82.....St. Petersburg
Nettles, Robbins,
402-5 Coachman Bldg. ..Clearwater
Nickle, Millen A.,
503-5 Coachman Bldg....Clearwater
Osgood, G. E.,
2804 4th St., S.....St. Petersburg
Peabody, J. D.,
Box 24 .....St. Petersburg
Pierce, L. H.,
care J. B. Balch..Kalamazoo, Mich.
Prather, B. T., First Natl.
Bank Bldg.....St. Petersburg
Putnam, Harry L., 201 Arlington
Terrace .....St. Petersburg
Quicksall, William E., 222 Taylor
Arcade .....St. Petersburg
Remington, Alvah C.,
304 West Ave.....Rochester, N. Y.
Rieger, O. Paul, Care Weirton
Steel Co.....Weirton, W. Va.
Roope, A. P.....Columbus, Ind.
Roush, Franklin W.,
Power & Light Bldg..St. Petersburg
Rudolph, Councill C.,
512 Power Bldg.....St. Petersburg
Ruff, Joseph F., Bank of
Clearwater Bldg.....Clearwater
Sackett, Harry R.,
1027 15th Ave., N...St. Petersburg
Sarven, James D.,
P. O. Box 193....Middleton, Mich.
Simcox, Lawrence, Clifton Springs
Sanitarium..Clifton Springs, N. Y.
Solomon, H. D.,
Power & Light Bldg..St. Petersburg
Strickland, Jesse A., 712 Power
& Light Bldg.....St. Petersburg
Stuart, M. H., 814 First Natl.
Bank Bldg.....St. Petersburg
Timberlake, Gideon, 6th Floor
Times Bldg.....St. Petersburg
White, Benjamin L., 202 First Natl.
Bank Bldg.....St. Petersburg
Whitford, Grace R.....Ozona

Williams, Carl A.,
Box 975.....St. Petersburg
Wood, Alvin J., 801 First Natl.
Bank Bldg.....St. Petersburg
Wylie, LeRoy A., 210-213 Medical
Arts Bldg.....St. Petersburg

POLK COUNTY MEDICAL SOCIETY

Carefoot, G. H., President...Ft. Meade
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Marble Arcade Bldg.....Lakeland
Watson, Herman, Sec.-Treas.,
P. O. Box 944.....Lakeland
Alexander, Omer R., Rm. 25 & 26
Beymer Bldg.....Winter Haven
Besenbruch, Peter W.,
Orange St.....Davenport
Biddle, Percy D., 309 E. 49th St., Care
Midtown Hospital..New York, N. Y.
Causey, Thomas W.,
307 Marble Arcade.....Lakeland
Clark, Samuel A.,
209 E. Main St.....Lakeland
Cline, R. L.,
P. O. Box 462.....Lakeland
Cordes, Henry B., Jr.,
P. O. Box 84.....Frostproof
Deal, Charles C.,
208 Bank Bldg.....Auburndale
Elder, Eugene B.....Knoxville, Tenn.
Epling, Brady D.....Lake Wales
Farmer, Charles H.,
City Hall.....Lakeland
Griffin, J. D.,
Polk County Trust Bldg...Lakeland
Hargrove, Julian L.,
Polk County Hospital.....Bartow
Hughes, Robert L.,
226 E. Main St.....Bartow
Koon, Alpheus C.,
513 W. Lemon.....Lakeland
Lester, John G.,
Marble Arcade.....Lakeland
Lindsey, Sherrod A.....Ft. Meade
Love, Cicero W.,
P. O. Box 505.....Lakeland
Lowry, J. B.....Nichols
McKnight, George S.....Haines City
McMurray, E. R.,
655 Wilson Ave.....Bartow
Martin, Emmett E.,
152 7th St.....Haines City
Mooty, Ross H.....Winter Haven
Murphy, C. H.....Bartow
Murphy, H. K.,
Polk & Main Sts.....Mulberry
*Oglesby, John McG.....Bartow
Overstreet, George C.,
Marble Arcade.....Lakeland
Pearce, C. C.....Mulberry
Richards, H. Mercer,
Box 72.....Lakeland
Shafer, W. W.....Haines City
Sherman, William E.,
716 W. Central Ave..Winter Haven
Simmons, Thomas G.,
Corlett Bldg.....Auburndale
Simpson, W. T.....Winter Haven
Stetson, A. G. C.,
941 S. Success Ave.....Lakeland
Sullivan, Raleigh R., 1006 Marble
Arcade Bldg.....Lakeland
Tillis, W. L., 215 Marble
Arcade Bldg.....Lakeland
Tinkler, B. R.,.....Lake Wales
Tomlinson, J. P.,
Salter Hospital .....Eufaula, Ala.
Vassar, T. D.,
Strand Bldg.....Lakeland
Weed, Walter A., Morrell
Memorial Hospital .....Lakeland
Wilhoyte, Roy E.....Lake Wales
Wilson, Cecil H.,
145 East Main St.....Bartow
Wilson, John F., Jr., 207-9 Spencer
Futch Bldg.....Lakeland

PUTNAM COUNTY MEDICAL SOCIETY

Hosey, John T., President.....Palatka
Warren, Edmund W.,
Sec.-Treas. .....Palatka
Campbell, Ezra T.....Welaka
Ford, Edward W.....Crescent City
Main, Daniel C.....Crescent City
Miller, W. S.....Palatka
Rosborough, D. Y.....Palatka
Strong, S. B.,
Prado 98.....Havana, Cuba
Woerner, L. .....Interlachen
Zeagler, G. M., Davis Bldg.....Palatka

ST. JOHNS COUNTY MEDICAL SOCIETY

Webb, Walter D., President,
Alcazar Hotel.....St. Augustine
Burnett, Wilbur E., Secretary,
118 Bay St.....St. Augustine
White, Herbert E., Treasurer, 401 First
Natl. Bank Bldg.....St. Augustine
Estes, Edgar S., 305-309 First
Natl. Bank Bldg.....St. Augustine
Guy, Walter B.,
52 Central Ave.....St. Augustine
Irwin, J. M.....St. Augustine
Parkinson, W. N.,
East Coast Hospital..St. Augustine
Potter, George W.,
East Coast Hospital..St. Augustine
Scruggs, S. A.....St. Augustine
Spencer, J. J.....St. Augustine
Stanton, Gordon .....Hastings
Stevens, E. Luther.....St. Augustine
Underwood, Arthur W.,
16 St. Francis St.....St. Augustine
Walkup, A. Clark,
116 St. George St.....St. Augustine
Walton, Milton.....Hastings
Worley, S. G.,
212 West King St.....St. Augustine

ST. LUCIE-OKEECHOBEE-INDIAN RIVER-MARTIN COUNTY MEDICAL SOCIETY

Newnham, J. A., President.....Stuart
Davis, Claude L., Sec-Treas.,
..... Okeechobee
Bishop, J. W. .....Lake City
Boothe, R. C.....Ft. Pierce
Clark, H. D., Ft. Pierce Bank &
Trust Bldg. .....Ft. Pierce
Council, Melton D.,
Arcade Bldg. .....Ft. Pierce
Glidden, C. H. .....Ft. Pierce
Hardie, Grover C.,
134½ N. 2nd St.....Ft. Pierce
Parker, J. D.....Stuart
Whiddon, Lester L.,
205-6 Arcade Bldg.....Ft. Pierce

SARASOTA COUNTY MEDICAL SOCIETY

Halton, Joseph, President,
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Patterson, John C., Vice-Pres.,
First Bank & Trust Bldg...Sarasota
Metzger, Frank C., Sec.-Treas.,
224 Commercial Court....Sarasota
Cribbins, Orville H.,
224 Commercial Court....Sarasota
Griffin, Harold W.....Villa Ricca, Ga.
Halton, Jack .....Sarasota
Harris, J. E.,
224 Commercial Court....Sarasota
Johnston, W. J.,
215 Commercial Court....Sarasota
Kennedy, David R., First Bank &
Trust Bldg.....Sarasota
Morton, Arthur O.,
Commercial Court .....Sarasota
Myers, Nicholas P.....Dowling Park
Taylor, T. W.,
Walpole Bldg. .....Sarasota
Wilson, Cullen B., First Bank &
Trust Bldg. .....Sarasota

SEMINOLE COUNTY MEDICAL SOCIETY

Mitchell, Clifford M., President,
..... Sanford
Langley, W. T., Vice-Pres.,
Meisch Bldg. .....Sanford
Denton, John T., Sec.-Treas.,
Meisch Bldg. .....Sanford
Knox, A. W.,
Brumley-Puleston Bldg.....Sanford
Martin, John W.,
Box 95 .....Oviedo
Park, Charles L., 515-16 First Natl.
Bank Bldg. .....Sanford
Puleston, Samuel,
Brumley-Puleston Bldg.....Sanford
Selman, G. S.,
Lake View Ave. .....Sanford
Smith, Henry D.,
108½ Park St.....Sanford
Stevens, Ralph E.,
First and Palm Ave.....Sanford
Strode, Robert C.....Melbourne
Tolar, Julian N.,
First St. .....Sanford

SUMTER COUNTY MEDICAL SOCIETY

Mitchell, W. E., Sec.-Treas.,
P. O. Box 237 .....Coleman
Albritton, Andrew B.....Wildwood
Wood, S. C. .....Leesburg

SUWANNEE COUNTY MEDICAL SOCIETY

Anderson, Thomas S., President,
P. O. Box 127.....Live Oak
Strickland, Henry M., Vice-
Pres. .....Live Oak
White, W. C., Sec.-Treas.,
412 S. Ohio Ave.....Live Oak
Airth, Henry F.,
106 W. Howard St.....Live Oak
Dicks, Reid E., Box 104, 22nd
St. Sta. .....St. Petersburg
Price, Joshua M.,
Alemar Bldg. .....Live Oak

TAYLOR COUNTY MEDICAL SOCIETY

Richardson, John R., President,
..... Carbur
Weeks, J. L., Vice-Pres.....Perry
Greene, Ralph J., Sec.-Treas.....Perry
Bryan, W. H.....Scanlon
Cline, D. E.....Perry
Culpepper, C. T.....Perry
Ellis, John C.....Perry
Warren, George H., Main St.....Perry

VOLUSIA COUNTY MEDICAL SOCIETY

Davis, Joseph B., President, Halifax
District Hospital....Daytona Beach
Miller, R. L., Vice-Pres.,
148½ S. Beach St....Daytona Beach
Wells, J. Ralston, Sec.-Treas.,
Woolworth Bldg. ...Daytona Beach
Bates, George L., 504½ Main St.,
Penn. Sta. .....Daytona Beach
Biddle, J. K., Rm. 606
Walpark Bldg. ....Mansfield, Ohio
Bohannon, Clyde C.,
154 1st Ave.....Daytona Beach
Bouchelle, Louis B.....New Smyrna
Brown, L. V. L.....DeLand
Carter, Emory A., Dreka Bldg...DeLand
Chandler, J. R.,
120 Volusia Ave.....Daytona Beach
Chowning, W. C.,
111 Palmetto St.....New Smyrna
Clemmer, Charles A.,
913 Main St.....Daytona Beach
Davis, C. W.,
231 Coates St.....Daytona Beach
Davis, George A.,
Dreka Bldg. .....DeLand
Dillard, T. H. .....DeLand
Esche, J. P., 315 S. Penn
Drive .....Daytona Beach
Farmer, Myron H.,
221 Orange Ave.....Daytona Beach
Fogarty, Joseph N.,
220 Magnolia Ave...Daytona Beach
Forster, Davis .....New Smyrna
Genge, Victor P.....Daytona Beach
Glatzau, L. W., Dreka Bldg....DeLand
Henry, H. W.,
205 State Bank Bldg...New Smyrna
Howe, Raymond, 229 N. Ridgewood
Ave. .....Daytona Beach
Howe, Roy,
222 Volusia Ave.....Daytona Beach
Johnson, Joseph L.,
135 Canal St.....New Smyrna
LeBreton, Prescott,
40 North St.....Buffalo, N. Y.
Merryday, H. L.....Daytona Beach
Miller, B. E.,
412 Canal St.....New Smyrna
Munson, Albert S.,
110 S. Boulevard.....DeLand
Myres, M. J., Rm. 5
Post Office Bldg....Daytona Beach
Pay, W. C.,
221 W. Rich Ave.....DeLand
Rawlings, James E.,
221 Orange Ave.....Daytona Beach
Taylor, Joseph E.....DeLand
Taylor, William H.,
6553 Harvard Ave.....Chicago, Ill.
West, Hugh.....DeLand
White, J. Blake.....Ormond Beach
Williams, W. J.....Seville

WALTON-OKALOOSA COUNTY MEDICAL SOCIETY

Huggins, E. L., President.....Freeport
McSween, J. C., Vice-Pres.,
.....DeFuniak Springs
Williams, A. G., Sec.-Treas..Lakewood
McGuire, J. J.....DeFuniak Springs
Spires, G. W. .....Darlington
Stephens, S. E. .....Laurel Hill
Webb, Edward P.,
City Pharmacy .....Crestview

WASHINGTON-HOLMES COUNTY MEDICAL SOCIETY

Harper, C. W., Sec.-Treas.....Chipley
Carter, George W.....Caryville
Coleman, W. E. .....Chipley
McClure, Herbert A. .....Chipley
Miller, G. C. .....Chipley
Paul, L. H. .....Bonifay
Tiller, O. B. .....Chipley

* Deceased.

STATE NEWS ITEMS

Dr. Guy L. Hunner of Baltimore recently addressed the Pinellas County Medical Society on the subject of "Ureteral Stricture and the General Practitioner."

* * *

The State Board of Health reports a case of rabies in a human being which occurred at Pensacola during the month of January.

* * *

The next meeting of the State Board of Medical Examiners will be held in Lakeland, June 16th and 17th. The Board has made a recent ruling that in the future, each applicant will be required to write his own examination in the English language, and will not be permitted the use of an interpreter, a privilege heretofore granted foreign applicants.

* * *

Drs. J. B. Farrior, J. C. Dickinson, J. L. Estes, J. W. Taylor and W. M. Rowlett of Tampa were guests at the annual banquet of the Pasco-Hernando-Citrus County Medical Society given at New Port Richey on the evening of January 9th. Dr. J. F. Jackson of Dade City, president of the society, after calling the meeting to order, turned the gavel over to Dr. G. A. Dame of Inverness, who acted as toastmaster. Dr. Farrior, the newly elected president of the Hillsboro County Medical Society, and Dr. Rowlett, representing the Florida Medical Association, as councilor of the Thirteenth District, gave talks on organized medicine. Dr. Herman Watson of Lakeland, chairman of the Legislative Committee of the State Association, spoke on the proposed Basic Science law. The occasion was proclaimed by all as one of the most delightful medical banquets they had ever attended.

* * *

Births in families of members of the Florida Medical Association:

To: Dr. and Mrs. M. W. Dodson, Pensacola, a boy—M. W. III, October 7, 1929.

To: Dr. and Mrs. F. Kitchens, Miami, a boy, John Linden Kitchens, November 1, 1929.

To: Dr. and Mrs. T. E. Morgan, Jacksonville, a boy, Thos. Edward Morgan, Jr., November 9, 1929.

* * *

Dr. J. J. Spencer of St. Augustine left recently for Brooks Field, Texas, where he will take a three months' course in aviation medicine and surgery. Dr. Spencer is a captain in the reserve corps.

On January 24th, the Pinellas County Medical Society held its bi-monthly meeting. The following scientific papers were read: "Lipiodol in Pulmonary Diagnosis"—Dr. J. C. Dickinson, Tampa; "Obstructions of the Pylorus in Infants and Children"—Dr. J. Knox Simpson, Jacksonville.

* * *

Dr. Lucille S. Blachly arrived in Jacksonville the last of January to assume the duties of Director of the Bureau of Child Hygiene and Public Health Nursing of the Florida State Board of Health, on February 1st.

* * *

Dr. Henry C. Dozier, president of the Florida Medical Association, announces the appointment of Dr. J. N. Moore of Ocala as representative of the Florida Medical Association to the one hundredth annual meeting of the Tennessee State Medical Association, to be held at Nashville, in April. Dr. Moore is a native of Tennessee and a graduate of Vanderbilt.

* * *

DUVAL COUNTY MEDICAL SOCIETY HAS COME TO THE FORE WITH A ONE HUNDRED PER CENT PAID MEMBERSHIP FOR 1929. THIS IS A SPLENDID ACHIEVEMENT FOR WHICH A GREAT DEAL OF CREDIT IS DUE DR. W. McL. SHAW, WHO SERVED AS TREASURER.

* * *

The Bureau of Vital Statistics of the State Board of Health has taken temporary quarters on the fourth floor of the Florida Theatre Building in Jacksonville. This was necessitated by the crowded condition in the State Board of Health Building. Dr. Paul Eaton, Director of Laboratories, and Dr. Lucille Blachly, Director of the Bureau of Child Hygiene and Public Health Nursing, will occupy the space vacated by the Vital Statistics Bureau.

* * *

The Suwannee River Medical Society met in regular session at Live Oak, January 10th. After dinner and a social program, a business and scientific meeting was held. The following papers were read by guests of the Society: "Repair of Hernial Openings with Facia Strips" (with lantern slides), Dr. Harry Peyton, Jacksonville; "Discovery and History of X-ray", Dr. W. McL. Shaw, Jacksonville.

Dr. Henry Hanson, State Health Officer, attended the opening session of the Post-Graduate Obstetrical Course which was conducted in Thomasville, Ga., during the week of January 27th to 31st. This course was held at the Archbold Memorial Hospital and was given by Dr. J. R. McCord, professor of obstetrics, Emory University. The course was sponsored by the Children's Bureau of the Department of Labor, and was free to physicians and others who wished to attend. A similar course is proposed for ten or fifteen different locations in Florida if the medical profession expresses approval and its desire to have such a course, which consists of lectures, lantern slide demonstrations and several moving picture films of operations and actual labor.

* * *

The many friends of Dr. J. E. McLeod of Cypress will regret to learn that he has been incapacitated for several months due to an accident wherein one of his knees was crushed. While convalescing, Dr. McLeod contracted influenza which delayed his recovery, but he is now gradually regaining his health.

* * *

The Sarasota County Medical Society held its annual election of officers on January 12th. Dr. T. W. Taylor was elected president, Dr. J. C. Patterson, vice-president, and Dr. F. C. Metzger, secretary-treasurer. Dinner was served to sixteen members and guests which comprised members from Manatee and Sarasota County Medical Societies. Following the dinner, a scientific program was held. The following papers were read: "Pellagra," by Dr. J. E. Harris, Sarasota; "Blood Transfusions," by Dr. D. R. Kennedy, Sarasota.

* * *

Drs. H. A. Barge and W. J. Barge of Miami announce the removal of their offices to 420-421 Calumet Building.

* * *

The annual election of officers of the Lee County Medical Society resulted as follows: Dr. W. H. Grace, Ft. Myers, president; Dr. R. W. Newton, Ft. Myers, vice-president; and Dr. H. Quillian Jones, Ft. Myers, secretary-treasurer.

* * *

Dr. Chas. E. Dowman of Atlanta addressed the Medical Study Club of Orlando February 1st at 8:30 p. m., his subject being "Intractable Pain." Following the scientific program, a buffet supper was served.

Dr. Homer L. Pearson announces the removal of his office from the Gowdy Clinic, 120 Shoreland Arcade, Miami, to 610 Huntington Building, Miami.

* * *

Dr. Maurice E. Heck of Miami is planning to give a course in surgical operative technique on the cadaver and on dogs during the months of April and May.

* * *

A letter has been received from the secretary-editor of the Tennessee State Medical Association, inviting the members of the Florida Medical Association to attend the next annual meeting of the Tennessee State Medical Association which will be held at Nashville, April 8, 9 and 10. This meeting will be the one hundredth anniversary of the Association's organization and a program is being planned which will be in harmony with the spirit of the occasion. There are many physicians in Florida who graduated from Nashville and other Tennessee institutions who will be particularly interested in this announcement.

Dr. Siegfried B. Bieker of St. Petersburg passed away January 11th. The cause of his death was cerebral hemorrhage. Dr. Bieker came to St. Petersburg from Alabama about five years ago and had offices in the Power and Light Building, specializing in urology. He received his medical education in Northwestern University. He is survived by his wife, Dr. Annette M. Bieker, who was associated with him in practice.

The many friends of Dr. Charles L. Jennings of Jacksonville will be interested to learn of his marriage to Miss Mattie Norris of Crossville, Tenn., which occurred Christmas day at Nogales, Sonora, Mexico. Dr. and Mrs. Jennings have returned home and are residing at 805 Lomax St., Jacksonville.

* * *

Dr. Gordon Stanton of Hastings recently suffered severe injuries as a result of a head-on automobile collision.

* * *

The following was omitted in the publication of the Proceedings of the Fifty-Sixth Annual Meeting of the Florida Medical Association in the April, 1929, issue of the Journal: "On motion, the House of Delegates authorized the Treasurer of the Florida Medical Association to provide up to $5,000.00 for the Legislative Committee, if needed in their efforts to pass a Basic Science bill."

Dr. E. W. Maechtle, formerly of Tampa, recently moved to Chicago. He is engaged in a research problem in neurology at Northwestern Medical School, which he anticipates will take two or three years.

* * *

Dr. W. M. Goodson of Miami announces the removal of his offices from 15 N. E. 11th St. to 315 Olympia Building.

* * *

Dr. J. M. Irwin was recently elected City Health Officer of St. Augustine, succeeding Dr. Edgar Estes, resigned.

* * *

Dr. and Mrs. E. W. Veal of South Jacksonville were recently called to South Georgia owing to the illness of the former's mother.

* * *

Dr. Henry Hanson, State Health Officer, and Dr. F. A. Brink, Director of the Bureau of Communicable Diseases of the State Board of Health, were in Gainesville on January 30th, to discuss the question of the early diagnosis of tuberculosis with the local health council. On the 20th of January, the State Board of Health, represented by the State Health Officer, the Directors of the Bureau of Communicable Diseases and the Bureau of Sanitary Engineering presented the result of a sanitary survey for Leon County and the City of Tallahassee, together with the recommendation that a full-time city and county health unit be established.

* * *

Dr. Ralph N. Greene of Jacksonville recently visited Miami, making the trip from Jacksonville in his Waco plane. He was accompanied by his brother, Major Loren Greene of the medical corps of the U. S. army.

* * *

Dr. and Mrs. J. N. Fogarty of Daytona Beach attended the opening of the Ponce de Leon Hotel at St. Augustine, January 5th.

* * *

Dr. Eugene C. Lowe of Key West has recently moved to Miami where he will practice his profession.

* * *

Dr. and Mrs. J. L. Boone of Jacksonville spent the Christmas holidays in Tallahassee with the latter's father, Dr. Edward Conradi.

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COUNTY SOCIETY	SECRETARY	MEETINGS				Dues Paid.
		Date	Time	Place	Luncheon?	
Alachua	J. E. Maines, Jr., M.D., Gainesville.	2nd Tuesday	12:00 Noon	White House	Yes.	
Bay	Don S. Fraser, M.D., Panama City.					27%
Brevard	I. K. Hicks, M.D., Melbourne.	Varies		Varies		
Broward	Ralph Lingeman, M.D., Ft. Lauderdale.	2nd Tuesday	8:00 P.M.	Chamber of Commerce	No.	
Columbia	T. H. Bates, M.D., Lake City.	1st Monday.	7:30 P.M.	Blanche Hotel		64%
Dade	R. M. Harris, M.D., Miami.	1st Friday	8:30 P.M.	Club Room, Huntington Bldg.	Occasionally.	
DeSoto-Hardee-Highlands	M. A. Hubert, M.D., Avon Park.		8:00 P.M.	Varies	No.	
Duval	Kenneth A. Morris, M.D., Jacksonville.	1st Tuesday	8:15 P.M.	Chamber of Commerce Building	No.	
Escambia	J. M. Hoffman, M.D., Pensacola.	1st Tuesday	8:00 P.M.	Board of Health Building	No.	
Hamilton	R. A. Barnett, M.D., White Springs.					
Hillsboro	J. T. Cowart, M.D., Tampa.	1st and 3rd Tuesdays	8:00 P.M.	Tampa Municipal Hospital	No.	
Jackson	C. H. Harrison, M.D., Cottondale.	2nd Tuesday	3:00 P.M.	Marianna	No.	
Lake	W. L. Ashton, M.D., Umatilla.	1st Thursday	12:30 P.M.	Eustis	Yes	20%
Lee	H. Quillian Jones, M.D., Ft. Myers.	3rd Friday	7:30 P.M.	Lee Memorial Hospital	No.	
Leon-Gadsden-Liberty-Wakulla-Jefferson	J. B. Brinson, Jr., M.D., Monticello.	Quarterly	3:00 P.M.	Varies	Yes.	
Madison	Geo. O. Davis, M.D., Madison.					
Manatee	J. M. Davis, M.D., Bradenton.	1st and 3rd Tues. Oct. to May; 2nd Tues. May to Oct.	7:00 P.M.	Dixie Grande Hotel	Yes.	
Marion	Thos. H. Wallis, M.D., Ocala.	3rd Thursday	12:30 P.M.	Harrington Hotel	Yes.	
Monroe	W. R. Warren, M.D., Key West.	1st Sunday	9:00 P.M.	Varies	Yes.	
Orange	J. R. Chappell, M.D., Orlando.	3rd Wednesday	8:30 P.M.	Varies	No.	
Palm Beach	R. G. Lewis, M.D., W. Palm Beach.	2nd Monday	8:00 P.M.	Court House	Yes.	
Pasco-Hernando-Citrus	Geo. R. Creekmore, M. D., Brooksville.	2nd Thursday	7:00 P.M.	Varies	Yes.	
Pinellas	O. O. Feaster, M.D., St. Petersburg.	Every other Friday	8:00 P.M.	500 Power & Light Bldg.	No.	
Polk	Herman Watson, M.D., Lakeland.	2nd Wednesday in Feb., Apr., June, Aug., Oct., Dec.	1:00 P.M.	Lakeland	Yes.	
Putnam	E. W. Warren, M.D., Palatka.	2nd Thursday	7:00 P.M.	James Hotel, Palatka	Yes.	
St. Johns	W. E. Burnett, M.D., St. Augustine.	3rd Tuesday	8:30 P.M.	Varies	Yes.	
St. Lucie-Okeechobee-Indian River-Martin	C. L. Davis, M.D., Okeechobee.	3rd Thursday	8:00 P.M.	Varies	Yes.	
Sarasota	F. Metzger, M.D., Sarasota.	2nd Tuesday	8:30 P.M.	Varies	Occasionally.	
Seminole	J. T. Denton, M.D., Sanford.	2nd Friday	8:00 P.M.	City Hospital		
Sumter	W. E. Mitchell, M.D., Coleman.	2nd Tuesday		Varies	No.	
Suwannee	W. C. White, M.D., Live Oak.					
Taylor	R. J. Greene, M.D., Perry.	Last Thursday	12:15 P.M.	Eldorado Cafe	Yes.	
Volusia	J. Ralston Wells, M.D., Daytona Beach.	2nd Tuesday	7:30 P.M.	Varies	Yes.	15%
Walton-Okaloosa	A. G. Williams, M.D., Lakewood.	3rd Thursday	8:00 P.M.	Varies	Occasionally.	
Washington-Holmes	W. C. Harper, M.D., Chipley.					

NOTE—Secretaries: Please submit information to complete the above schedule.

Dr. W. H. Taylor, formerly of Daytona Beach, recently moved to Chicago. His address is 6553 Harvard Avenue.

* * *

Dr. W. B. Guy of St. Augustine recently returned from an extended trip to the Orient and England.

* * *

Dr. C. E. Tumlin of Miami has moved his clinic to 350 Olympia Building. Associated with Dr. Tumlin are Drs. W. M. Goodson and W. H. Ellis.

* * *

Dr. L. L. Andrews of Orlando, director of the Orlando-Florida Sanitarium, recently returned from Atlanta where he attended the meeting of the American College of Surgeons.

* * *

Dr. W. J. Buck of Belle Glade was recently elected commander of the American Legion Everglades Post No. 20.

* * *

Dr. Wm. A. Oughterson, formerly of West Palm Beach, has moved to 2054 E. 90th St., Cleveland, Ohio.

* * *

Dr. Harold D. Van Schaick was recently elected head of the department of surgery at St. Luke's Hospital, Jacksonville.

* * *

Dr. John Boyd of Jacksonville was recently appointed by Dr. Henry C. Dozier, president of the Florida Medical Association, to represent the Association on the Executive Committee of the Florida Public Health Council which met in Jacksonville on February 12th.

* * *

The Jackson County Medical Society recently held its annual election of officers, which resulted as follows: Dr. W. C. Box, Graceville, president; Dr. D. A. McKinnon, Marianna, vice-president; and Dr. C. H. Harrison, Cottondale, secretary-treasurer. Dr. M. Q. Burns of Blountstown was elected delegate to the annual meeting of the Florida Medical Association, with Dr. J. B. Dowling of Alliance as alternate. The following members were elected to the Board of Censors of the Society: Dr. N. A. Baltzell, Marianna, one year; Dr. R. L. Kennedy, Malone, two years, and Dr. T. H. Hudgens, Sneads, three years.

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A smoker was held by the Duval County Medical Society recently. Dr. Guy L. Hunner of Johns Hopkins was guest of honor and the principal speaker of the evening. He chose as his subject "Ureteral Strictures." The members of the Society honored Dr. Hunner by a large attendance. A number of out-of-town guests were also present.

* * *

The Suwannee River Medical Society held its annual election of officers on December 13th at Madison. Dr. Geo. O. Davis of Madison was elected president; Dr. R. B. Harkness of Lake City, first vice-president; Dr. H. M. Strickland of Live Oak, second vice-president, and Dr. Eustace Long of Madison, secretary-treasurer. After the business meeting, a social program was enjoyed.

* * *

The building located at 1022 Park St., Jacksonville, formerly known as the "Wade Building," has been renamed the "Medical Arts Building," inasmuch as it is given over almost entirely to medical offices.

* * *

The Rockefeller Foundation has given $500,000 to Yale University, New Haven, Conn., which will be used to establish a laboratory station on a 200-acre tract at Orange Park, Florida, for the breeding and scientific study of anthropoid apes. A special laboratory will be built in which will be made a detailed observation of the habits, social relations, life history and psychobiologic development of the chimpanzee, the gorilla, the orangutan and the gibbon. It is thought the exhaustive studies of anthropoids will be of great importance in connection with the program of the Institute of Human Relations at Yale. The studies will include problems in physiology, behavioral adaptivity, mental defects and diseases among the apes, and it will be under the general supervision of Robert M. Yerkes, Ph.D., who has been at work at Yale for five years on comparative psychobiology. There will be an advisory council including representatives of Yale and Edwin G. Conklin, Ph.D., Princeton University; Dr. Milton J. Greenman of the Wistar Institute, Philadelphia; Dr. Theobald Smith of the Rockefeller Institute; Clark Wissler, Ph.D., of the American Museum of Natural History, New York; Dr. H. Gideon Wells of the University of Chicago, and John C. Merriam, Ph.D., president of the Carnegie Institution of Washington.

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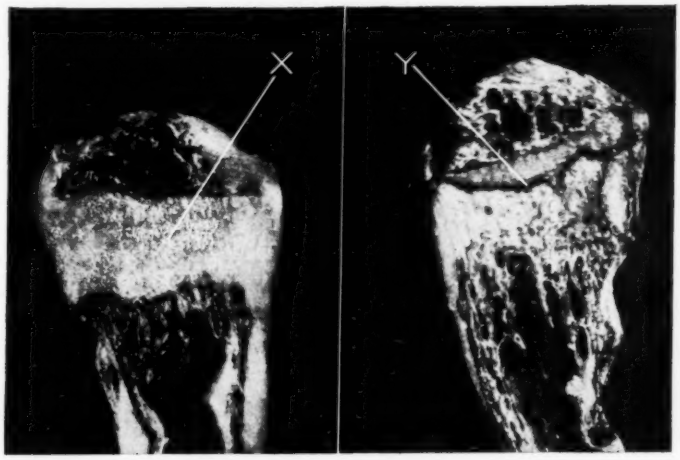

Illustrating "Line Test" method of standardizing Vitamin D content. At left, the leg bone of a rachitic rat showing induced decalcification area (X). At right, healing has begun, as evidenced by initiation of recalcification at dark line (Y).

HOW can vitamins be "measured?" What is meant by "standardized" when applied to Cod-liver Oil? Here, briefly, is the method followed in determining the vitamin content of Parke-Davis Standardized Cod-liver Oil:

To test for *vitamin A potency* the oil is given orally to young albino rats which have been fed on a diet free from vitamin A. We ascertain how much oil is needed daily to correct the induced typical eye condition (xerophthalmia) and to institute a specified rate of growth. The daily minimum amount of oil required to bring about this change constitutes one vitamin A unit.

Every lot of Parke-Davis Standardized Cod-liver Oil must contain not less than 13,500 units of vitamin A in each fluid ounce.

In determining *vitamin D potency* we use our quantitative adaptation of the "line test" technique of McCollum, Simmonds, Shipley, and Park. The oil is fed to young rats in which rickets has been induced. We measure the minimum amount of oil required per day over a period of ten days to initiate recalcification in the leg bones. This amount represents one vitamin D unit. Each fluid ounce of Parke-Davis Standardized Cod-liver Oil contains not less than 3000 vitamin D units.

Parke, Davis & Company was the first commercial laboratory to assay Cod-liver Oil for both vitamins A and D. Parke-Davis Standardized Cod-liver Oil is backed by years of research work in various phases of nutrition chemistry. Quite aside from its vitamin richness, this product has other distinguishing features which will appeal to you. It is clear, bland, and as nearly tasteless and odorless as a pure Cod-liver Oil can be. May we suggest that in prescribing Cod-liver Oil for your patients you specify the Parke-Davis product?

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TUBERCULOSIS ABSTRACTS

A REVIEW FOR PHYSICIANS

ISSUED MONTHLY BY THE NATIONAL TUBERCULOSIS ASSOCIATION

THE first clear differentiation between the bovine and human types of tubercle bacillus was made in 1898 by Theobald Smith. When it became evident that the bovine tubercle bacillus may be conveyed to the human through the drinking of milk, the sanitary control of this important food was demanded. Pasteurization and the gradual but steady elimination of tuberculous cows have undoubtedly been factors in reducing tuberculosis, particularly the osseous and lymph glandular forms commonly seen in children. In England, the problem seems to be more difficult and unyielding than it is in the United States, according to William G. Savage, health officer of Somerset, from whose book, "The Prevention of Human Tuberculosis of Bovine Origin," most of the following information is abstracted.

HUMAN TUBERCULOSIS OF BOVINE ORIGIN

There is little statistical evidence to prove the direct relationship between the extent of bovine tuberculosis among cattle and the incidence of human tuberculosis of bovine origin. Satisfying studies of this kind are obviously difficult to make, and those that have been made are inconclusive.

PREVALENCE OF DISEASE

The exact prevalence of bovine tuberculosis among humans is not easy to determine. It is impossible to decide by clinical means whether a given case is of human or bovine origin, although the organism may, by a somewhat laborious bacteriological procedure, be isolated and identified. Several bacteriologists have undertaken studies of this kind, and their total number, while not large, is enough on which to form an estimate of the percentage of bovine tuberculosis. On the basis of these studies, Savage arrives at the conclusion that 1% of the respiratory and 23% of

(*Continued on page* 380)

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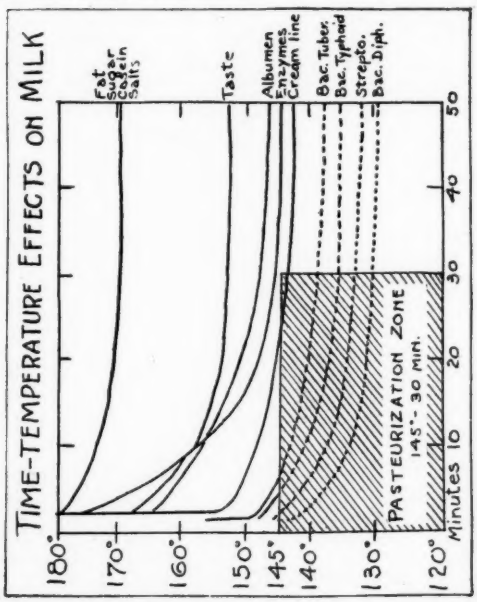
A corps of graduate nurses, especially trained for the work, together with a chartered training school, are important features of the institution.

non-respiratory cases in England are of bovine origin. From this, he calculates that in 1927 a total of 310 cases of respiratory and 1,635 cases of non-respiratory tuberculosis which ended in death were of bovine origin. Moreover, the cases not ending in death, while not ascertainable, must be considerable, and responsible for a vast quantity of suffering.

EXTENT IN UNITED STATES

In the United States, Park and Krumwiede studied in 1910 the bacteriological origin of 435 cases of tuberculosis. About 7% of the entire group (all ages) were of the bovine type. However, of the group under five years of age, about one-third were of bovine origin, and slightly over half of these were involvements of the cervical glands. Subsequent to that study, New York City adopted the practice of pasteurizing all milk supplies, with the exception of about 1.5% which was certified. This did not apparently affect the incidence of pulmonary tuberculosis among children, but the percentage of cervical cases of bovine origin was reduced to less than half its previous figure.



METHOD OF TRANSFER

Human tuberculosis of bovine origin may nearly all be charged to the use of milk containing living tubercle bacilli, though cream, butter

(*Continued on page* 382)

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4. Its use extends the benefits of biological treatment, since more than 60 per cent. of pneumonia cases are caused by Types I and II; whereas formerly an effective serum could be used only in cases of Type I.

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and cheese cannot be altogether ignored. The milk is infected usually from the lesions on the udder, though contamination of milk from feces containing excreted tubercle bacilli is also common. Every cow that reacts positively to the tuberculin test should, therefore, be regarded as a potential source of infection, for both human beings and cows.

CONTROL OF BOVINE TUBERCULOSIS

Methods for dealing with the problem in the United States are primarily two-fold; the eradication of the disease among cattle by slaughtering positive tuberculin reactors and the pasteurization of milk. The Federal Department of Agriculture, through the various state bureaus and departments of animal industry, has pursued with vigor its policy of "cleaning" herds and accrediting those free from the disease. While there are many practical difficulties in the way and the cost in terms of subsidies for slaughtered cattle is expensive, the percentage of infected cows is gradually lessening.

The practice of "designating" or certifying certain milk will probably never be practicable on a wide scale because of the difficulty of adequate, reliable inspection. Nor does certification take sufficiently into account possibilities of infection other than tuberculosis, such as scarlet fever, septic sore throat and typhoid fever. Recently, cases of undulent fever have been reported as having been acquired from accredited herds free from tuberculosis.

HEAT TREATMENT OF MILK

Pasteurization admittedly has its failings. Machinery and methods have been perfected to a high degree of efficiency, but the human factor frequently fails, and this can be controlled or supervised only with great difficulty. Moreover, standards regulating the process vary widely according to communities; pasteurization may mean something entirely different in one city than it does in another. However, efforts are now being made by the U. S. Public Health Service to restore order out of chaos. With the aid of leading state health officers, the Service has drafted a Standard Milk Ordinance, suitable for adoption by municipalities. The particular advantage of the ordinance is that it defines clearly the many commercial and technical terms involved in milk production methods. Pasteuriza-

(*Continued on page* 384)

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tion, it states, "shall be taken to refer to the process of heating every particle of milk or milk products to a temperature of not less than 145 degrees Fahrenheit, and holding at such temperature for not less than 30 minutes in pasteurization apparatus approved by the health officer, the temperature and time being automatically recorded by a temperature and time recording device approved by the health officer."

NO INJURIOUS EFFECTS

Milk properly pasteurized is not injured as a food to any appreciable extent. Apparently, Vitamins A and B are not affected, Vitamin C is reduced in amount, and little is known as to the fate of Vitamin D. This slight loss of vitamin content may be restored in a child's feeding by the addition of a small quantity of fruit juice.

How heat at given periods of time affects the food constituents and qualities of milk, as well as certain common bacteria which may contaminate milk, is indicated in the chart.

According to the author, the American method of dealing with bovine tuberculosis is not applicable in England because the dairy business is organized on a much more haphazard and decentralized basis, making supervision almost impossible, and also because the slaughter of some 40% of the dairy cattle (which would be necessary) would impoverish the state and also cause a milk famine. He suggests a practical but elaborate plan of gradually cleaning the herds. Space forbids discussion of details, which seem sound and workable.

Apparently assuming that the general practice of pasteurization would be too readily seized upon as a substitute for the more radical measure of eliminating tuberculosis among cattle, the author of the proposed English plan minimizes the value of pasteurization and speaks of it as "a confession of failure." With this feeling, American sanitarians would surely not agree. Clean milk regulations have not discouraged the campaign to free cattle from tuberculosis; that being a worthy object in itself, viewed purely from an economic standpoint. Pasteurization is not advocated as a means of making dirty milk clean. The ideal is to produce milk as clean as possible and to supplement this by heat treatment. The possibilities of contaminating this food product in its devious trip to the consumer are numerous; and pasteurization is but an added protection against tuberculosis, as well as many other dangerous infections.

(This review secured by the Florida Public Health Association from the National Tuberculosis Association).

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